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TREATMENT OF INFANTILE PARALYSIS.*

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In attempting to bring forward for your consideration the subject of the modern treatment of infantile paralysis or anterior poliomyelitis, I am met at the outset by the difficulty of presenting adequately, in the time at my disposal, so extensive a subject. Two courses are possible, one to present a synopsis of the whole subject, laying equal stress upon all parts, and the second is to pass hastily over those aspects of treatment which are well established and considered in the text-books on orthopedic surgery and, in the time allotted me, to discuss more fully that part of the treatment in which recent progress has been made. Thus the operative treatment of infantile paralysis will form the bulk of the paper because much of this part of the subject has not yet found its way into general literature and exists only in monographs, special treatises and in the practice of individual operators. In no department of orthopedic surgery has progress been more rapid, more gratifying, or more brilliant than in this matter of the operative treatment of infantile paralysis.

Infantile paralysis is an affection of the early second dentition, three-quarters of the cases beginning in the first three years of life. Its etiology is unknown, but its sudden onset, the feverish attack generally ushering it in, and its occasional epidemic character suggest an infectious origin. When fully developed, it exists as a motor paralysis, and sensation is not impaired. The paralysis may involve one or more entire limbs or it may affect only certain muscles of a limb picked out more or less at random. The distribution of the paralysis is as follows: one leg in two-fifths of all cases, both legs in a little over one-fifth of all cases, the arm and leg of the same side in one-eighteenth of all cases. The arm is involved much less frequently than the leg. The paralysis is due to a destruction of the motor cells in the anterior horns of the spinal cord, the inflammation, according to the more recent ideas being spread through the gray matter, which results in the destruction of the ganglion cells and the shrinkage of the horn on that side. The practical point is that *the damage done to the cells is final;* it cannot be repaired beyond a certain point, and it represents a destruction of nervous tissue in the spinal cord expressed by a loss of muscular power. This conception aids in formulating treatment. The peripheral nerves show changes similar to the degeneration following simple nerve division. The muscles show atrophy of the parenchyma with conversion to fibrous and even fatty tissue, but the nuclei remain. These changes appear to be due to non-use and the persistence of the nuclei shows the possibility of regeneration.

The diagnostic signs are as follows: a motor paralysis occurring in young children, generally beginning with a sudden feverish onset; the established paralysis is shown by a loss of muscular power in some or all of the muscles of a limb, by wasting of the muscles, coldness and blueness of the limb; a loss of tendon reflexes in affected muscles; and, the reaction of degeneration in the affected muscles; pain is an occasional accompaniment of the acute stage.

Having thus defined just what will be discussed as infantile paralysis, it is possible to go forward with the discussion of its treatment.

Treatment of the stage of onset. It is obvious that during the acute inflammatory stage of the affection, with a process of unknown etiology attacking the anterior cornua of the spinal cord, we have no therapeutic measures likely to be of value in checking or limiting the process. As a matter of fact, the diagnosis is seldom made until the acute attack is over, the affection passing for grippe, indigestion, tonsilitis, rheumatism, or cerebro-spinal meningitis, until the paralysis is discovered.

Treatment of the early convalescent stage. For a few weeks after the onset, there is, in practically all cases, a spontaneous improvement. It frequently happens that both arms and both legs, or both legs are paralyzed at first, and as the improvement progresses only one leg is ultimately left paralyzed. Again, one leg may be completely paralyzed at the outset and later recover power in some of the mus-

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cular groups, leaving other groups paralyzed.

It is our business, therefore, in this stage, the duration of which may be estimated at two or three months, to see that this spontaneous tendency to improvement is in every way favored and promoted. Muscles that are stretched do not recover power as rapidly as do muscles that are not stretched, and a paralyzed foot should be kept at right angles to the leg and not allowed to support the weight of the bed-clothes and thus to be always in a position of plantar flexion. The dangling foot of complete paralysis is familiar to all and efforts should be made from the outset to prevent its development, by support in a non-deforming position. This right-angled position of the foot can be easily secured by a posterior plaster shell, a splint of tin or wood, or any similar contrivance. During this stage, as soon as tenderness has disappeared, massage and electricity are of great value. The aim of treatment in this stage, therefore, is to prevent muscular stretching and to stimulate and improve the nutrition of the muscles in order that the child may reach the stationary period with the least possible disability.

Treatment of established paralysis. Each case of infantile paralysis, when fully established months or years after the onset, presents two problems which must be met by proper therapeutic measures. These are

(1) Contraction deformity.

(2) Loss of muscular power.

(1) Deformity.—The most common deformity to be met and corrected is caused by the shortening of the unparalyzed muscles, which are no longer antagonized by their paralyzed opponents. If, for example, the muscles at the front of the leg are paralyzed, and those at the back of the leg remain sound, the foot will be, in the course of time, drawn into the position of permanent plantar flexion, the heel will not touch the ground when the child walks, and the condition of permanent talipes equinus is present, which will prevent proper walking. If the muscles at the back of the leg are paralyzed and those at the front are unaffected, the foot will be drawn into a position of permanent dorsal flexion and the patient will walk on the heel. If the muscles at the inner side are paralyzed and those at the outer side are not a flat foot will result. If the outer muscles of the leg have lost their power and the inner ones are active, the patient will walk on the outer border of the foot, like a patient with congenital club foot. If combinations of these conditions exist, correspondingly combined deformities will be found. If the extensors of the leg on the thigh are paralyzed, the knee is frequently permanently contracted in a flexed position. If the extensors of the thigh on the pelvis lose their power and the flexors are active, flexion deformity at the hip joint may be found. Similar contraction deformities may be found in the arm.

Flexor muscles are, on the whole, less affected by the paralysis than extensors, and contraction deformities are therefore, as a rule, flexion deformities. Again, deformity may occur in a limb completely paralyzed not from unopposed muscular pull but from the continued maintenance of a vicious position. For example, in a leg completely paralyzed, the so-called "flail leg," the maintenance of a drop foot month after month generally results in a permanent contraction of the shortened tissues at the back of the leg and a permanent "foot drop" exists, due to contracted tissues.

It must be obvious, therefore, that one of the first and most important principles in the treatment of infantile paralysis is that, before applying apparatus or transplanting tendons, deformity must be rectified.

The correction of the deformity is easy. In the milder cases it is accomplished by a series of corrective plaster bandages; and in other cases by tenotomy, fasciotomy and myotomy. Before beginning on either mechanical treatment or tendon transfer, it should be possible, by gentle force, to put the joint in a normal position with the hands. For example, a boy ten years old had both legs paralyzed in early childhood and had never since stood erect or walked. Both hips were contracted in flexion, both knees were flexed by contractions in the popliteal space, and foot drop existed on both sides. He got about like a quadruped on his hands and knees. It was obvious that no apparatus could do him any good, for his legs could not be put into a position which would make weight-bearing possible. The contraction presented an insuperable obstacle to successful treatment. The division of his tendo Achillis, his hamstring muscles and the contracted soft parts that held his hip flexed, was accomplished in a short and simple operation, and in a few weeks he was walking about on crutches with his legs held straight by two light wire splints.

Let me again repeat the all important principle that contraction deformity should be relieved when it is present before proceeding to other treatment.

The mistake that is made most often in practice is to pursue massage and electrical treatment after the development of contraction deformity has occurred, and to allow uncorrected deformity in a growing child to persist while measures of treat-

ment are tried which must needs be inadequate on account of it. So long as a vessel is fastened to the dock by stout cables you may apply steam power, the force of the sails, the pull of another boat, or what you like, but you will accomplish nothing until you unfasten the cable.

Massage is of great value at all stages of the affection but it does not do away with the necessity of removing deformity or using proper braces. To allow a growing child to walk on a distorted foot is to make a permanent bony deformity quite likely, and the longer practically efficient methods are delayed, the harder it will be to obtain a good result.

So far as results are concerned it may be said in general that every case of infantile paralysis found in the adult or child, no matter how severe or neglected, may be improved by rational treatment and all but a very few may be made to walk.

Having then removed the deformity, if it exists, there are two methods of procedure possible, one mechanical,—the affected limb being held in a correct position for walking by apparatus; and the other, operative,—undertaken with a view to making apparatus unnecessary.

Mechanical treatment of infantile paralysis. The object of mechanical treatment is to support the leg, for example, in such a way that it may be used for weight-bearing. For instance, the quadriceps extensor cruris, the large muscle at the front of the thigh, is paralyzed and walking is not possible because when weight is borne on that leg the knee flexes, as there are no muscles to hold it extended, and the patient falls or progresses with his hand pressing back the thigh to prevent it from flexing.

The object of mechanical treatment is to hold the knee extended during weight-bearing, which may be done in theory by a plaster of Paris bandage, embracing the leg and thigh, or by a ham splint holding the knee straight, but much more easily by some light orthopedic appliance holding the knee extended.

This supporting use of apparatus is also exemplified when the muscles at the inner side of the leg and ankle are paralyzed and the foot rolls over into extreme flat foot when weight is borne on it. Here a combination of flat foot plate and brace to the leg corrects the deformed position and makes walking possible.

The use of apparatus is therefore two-fold: first, to hold the limb in a position which makes possible walking and weight-bearing; and, second, to prevent and correct deformed positions caused by the lack of important muscles.

Apparatus, however, must fit with accuracy to be efficient. It is constantly being outgrown and getting out of repair. When looked on as something to be worn through life, it assumes the aspect of a serious burden and handicap. Therefore, if its use can be avoided it is desirable to do so. On the other hand, many cases can be treated only by apparatus, its use is beneficial to the stretched muscles, and the fact that it prevents deformity means that it promotes muscular recovery and aids in the balance of the muscles by enabling them to be used in a more normal way. It is not uncommon to see muscles apparently paralyzed, recover function enough to be of use by means of a suitable brace.

The details of treatment by apparatus can be found in text-books on orthopedic surgery. Leaving the question of treatment by apparatus at one side one comes next to the question of the operative treatment of infantile paralysis, the line in which modern progress has been made. As to operation on the seat of the lesion itself there is nothing to be done, there is a destruction of motor cells in the cord and the paralysis is the expression of this. But the paralysis of a limb is most frequently not complete, certain groups of muscles being paralyzed while others are spared. The constant pull of the non-paralyzed muscles causes deformity and disability; there is too much muscular power on one side and too little on the other.

Operative treatment of infantile paralysis. The hope of operative relief lies in the possibility of transplanting the insertions of non-paralyzed muscles from a location where they are not needed or are harmful to a location where they are useful to supplement or replace the action of paralyzed muscles. For example, the anterior and posterior tibial muscles lie at the inner side of the leg in front of and behind the tibia and hold the foot in its normal position resting on its outer border, one pulling it up and in and the other down and in. If they are paralyzed the muscles at the outer side of the leg pull the foot over into a position of extreme flat foot and walking becomes difficult or impossible and, as the bones of the foot grow, they become deformed by growth under abnormal conditions.

If, now, one cuts off the tendon of the extensor of the great toe, which is not paralyzed, and sews the end of the tendon to the periosteum of the scaphoid, the anterior tibial muscle is replaced by a weaker muscle but by one capable of performing at least part of its function, with a chance of its increasing in power under increased demands. In the same way, one of the peroneal tendons is cut at its distal end at the outer border of the foot and brought around between the tendo Achillis and ankle joint,

is carried under the inner malleolus and inserted into the periosteum at the inner border of the foot to replace the tibialis posticus muscle. In this way two important indispensable paralyzed muscles are replaced by two muscles which can be spared from their original insertions. This very proceeding may be followed by a practical restoration of function in a foot which would otherwise have been of little use and getting progressively worse. But this transfer must be done according to definite rules and for good results careful after-treatment is of primary importance.

Instead of dwelling in detail on the varieties of operation to be performed at each point, it will be my effort to emphasize more the principles and the operative technic. A careful plan of operation is essential. Each muscle controlling the affected joint must be tested to see whether it is paralyzed or not, by making the patient perform voluntary movements of that joint and, as the operation is not advisable in very young children, the patient will be old enough to perform voluntary movements when told to do so. The foot, for example, is voluntarily dorsally flexed, plantar flexed, adducted and abducted, the toes are flexed and extended and the active muscles identified by the tightening of their tendons under the surgeon's finger. Paralyzed muscles will not contract and the movements caused by them will not be made. One then notices the child in standing and walking to see in what line the foot needs support,—does it fall in or out, does it need more muscular strength in dorsal or plantar flexion, in short in what line does it require muscular support to be more normal in its functions? One is then in a position to decide what muscles are available for transplanting and to work out a definite anatomical solution in advance which is to be carried out on the operating table. Electrical examination at this stage is not of great value, for muscles which are not sufficiently vigorous to be evident to the finger of the surgeon are not likely to possess much value when transplanted. The question to be solved is this: What good muscles are available to replace paralyzed ones, can they be spared from their proper insertions, are they nearly enough allied in line of power to make them good substitutes?

The removal of deformity as a preliminary to other treatment has been sufficiently dwelt on already, although slight degrees of contraction deformity may be corrected at the same sitting as the tendon transference. If the deformity is of marked degree it should be corrected by a preliminary operation and the tendon transfer done some days or weeks later.

Technic. The strictest possible asepsis is necessary to obtain good functional results, for the operation frequently requires a good deal of dissection, long stretches of tendon sheath are exposed, many silk sutures may be required (catgut has not been favorable), and, in the modern operations, strands of coarse silk of considerable length will often be left under the skin as substitutes for tendons. This combination of circumstances is not one that will tolerate any looseness in aseptic technic. The infection of such a wound is no light matter and militates greatly against a good result.

The operation is preferably performed with the Esmarch bandage and tourniquet. The tendon to be transferred is exposed by a cut near its insertion and is divided transversely. Long cuts are naturally undesirable on account of scar contraction but transferred muscles must not turn short corners and enough of the tendon must be exposed to ensure a straight line of pull between the origin and the insertion of the muscle. For example, if the peroneus longus is to be transferred to the inner side of the foot, the peroneal tendon is exposed and identified by an incision two inches long behind the external malleolus, and a short incision on the outer border of the foot is sufficient to expose the distal end of the tendon and permit its division. After the tendon is cut, a silk retaining suture is passed through its end and the whole lower part of the tendon is pulled out of the incision behind the outer malleolus through which the tendon was originally exposed. The tendon to be transplanted, with the remaining suture of silk at its lower end, thus hangs out of the wound and should be wrapped in a gauze pad or sponge and must not be unduly handled. The line of pull of this tendon when transplanted is then studied, and the tendon in its course freed far enough up to ensure a straight pull and an avoidance of corners.

An incision over the scaphoid at the inner side of the foot is then made for its insertion and the tendon passed under the skin, from the opening behind the malleolus, under the tendo Achillis to the point of insertion by means of forceps.

In the early history of the operation the attachment of the distal end of the transplanted tendon was made to the tendon of the paralyzed muscle, but paralyzed tendons stretched and poor results followed and the better modern technic lies in insertion into the periosteum at the desired location, the so-called periosteal method, or periosteal implantation, or Lange's method. Some operators still advocate the insertion into tendons but the breaking strength of a tendon sewed to another is much less

than that of a tendon attached to periosteum, in the cadaver at least.

The periosteum is divided by a linear incision, the edges turned back and a groove made in the bone deep enough to hold the tendon. The tendon to be transferred is laid in this groove and firmly stitched to the periosteum by two or three stout silk sutures passed on a stout curved needle. These sutures pass through both periosteal flaps and the tendon, uniting the whole into one mass. Muscles must be inserted on the stretch and no point in the technic is of greater importance than this. The foot must be held in an overcorrected position during and after the muscular attachment and the tendon of the muscle must be tight even in this overcorrected position when once attached. It is not necessary to close by sutures the opened sheath of the tendon. The skin wounds are closed by catgut sutures. Some operators prefer to leave one or two strands of silk, or small strips of gauze, in the angle of the skin wound for twenty-four to forty-eight hours to secure the drainage of moisture from the wound, but if one has perfect confidence in one's asepsis, it is simpler to close the skin wound tightly.

Holding the foot always in the overcorrected position, the tourniquet is removed and the blood allowed to return to the limb, the edges of the incisions being allowed to become pink before applying the final dressing. It is sometimes found that in the altered relations the skin wound has been too tightly sutured and a looser line of stitches must be put in to prevent necrosis of the edges of the incision. The dressing is then put on and a plaster of Paris bandage applied which, in the case of operations on the foot, should always include the knee, and, in the case of the knee, always include the foot, the foot, of course, being held in an over-corrected position.

To repeat the important points in operative treatment:

1. A definite operative plan elaborated beforehand.
2. The previous correction of deformity.
3. The strictest asepsis.
4. A straight line of muscular pull.
5. Periosteal insertion of transferred tendons.
6. Attachment of muscles on the stretch.
7. The maintenance of an over-corrected position of the joint during and after muscular attachment.

Although it is simplest and best to transfer the whole of a tendon to a new insertion, it is also possible to use part of a tendon for transfer and to leave part in the original situation. For example, the peroneal muscles at the outside of the leg are paralyzed and the foot is in a position like that of congenital club foot. It is essential for proper position and walking to get a pull on the outside of the foot; the gastrocnemius is intact, and no other muscle is available. The tendo Achillis is split in its length for two inches from its insertion, the outer half is freed from the os calcis and into this freed end of the tendon are sewed four strands of heavy silk, which are then carried forward to be inserted into the outer border of the foot, thus prolonging the tendo Achilles, which will then act as usual to plantar flex the foot, but will also act as a peroneal to abduct and evert the foot. The difficulty about the use of a tendon for two purposes is that it has not been shown that the two halves ever come to act independently.

The best results will be obtained from the simplest operations.

The development of tendon transplantation has led to the interesting demonstration that a piece of stout silk may be substituted for a tendon when it is too short to reach its insertion or when it must be lengthened. This silk becomes impregnated with and surrounded by tendinous substance until for function, strength and every other purpose, it becomes as good a tendon as any. This simplifies tendon transfer very much because it makes one independent of the length of tendons, which can by this simple process be implanted wherever desired.

For example, the extensor of the leg upon the thigh is paralyzed and the weight cannot be borne on the leg. Three good hamstring muscles are available for transfer. It is not desirable to cut all the flexors of the leg, especially if the gastrocnemius muscle is also paralyzed. Two of the three hamstring muscles will then be chosen to transfer forward to the front of the tibia into the patella ligament but they will not reach to their new insertion. Through the distal end of each hamstring tendon is sewed a piece of stout silk, which is then carried in two or four strands forward to be inserted into the ligamentum patellæ to transform the hamstring action from flexion to extension. The silk is prepared by boiling for fifteen minutes in 1-1000 corrosive sublimate solution and is kept in this solution until used.

In general, the transplanted muscle having been attached to its new position the other tendons of the foot are investigated. If they are slack, they are to be shortened, either by passing a quilting suture in their length or by cutting out a piece and uniting the cut ends. If the other tendons are too tight, they should be lengthened either by a plastic tenotomy or by cutting the tendon, allowing it to separate, and connecting the two ends by stout silk

sutures which will in time be covered by tendinous material.

It is important so far as practicable to restore the normal balance of the muscles of the foot.

But the operation is only half of the story in tendon transfer, for the after-treatment is quite as important, and many an excellent operative result is followed by a miserable functional one because of ineffective after-treatment. All of the men who do many of the operations are realizing that a great many of the bad results at one time reported were due to this omission.

After operation, the patient, if a child, should be quiet in bed or in the horizontal position for two or three weeks with, of course, a snug plaster of Paris bandage. This bandage is worn for from six to twelve weeks after operation according to the severity of the operation and the strain likely to come on the transferred tendon. The plaster is then split and removed temporarily to allow measurement for some supporting brace to prevent strain from coming on the new tendon, or the split plaster is used as a walking splint, holding the foot still in its over-corrected position. Daily massage and light exercises for the new tendon should begin at this period, the plaster being removed daily for the purpose and, not for at least six months after operation, should strain be allowed to come on it. It is essential that the transferred muscle should be developed by exercises before weight is allowed to come on it.

I have dwelt thus in detail on operative technic and after-treatment because the functional result is so very dependent on following the rules. The operation is by preference to be performed during later childhood and is applicable to adults in a high degree.

To give a list of the separate applications of the tendon transference would be simply to weary you. One author has tabulated over one hundred different operations to be done at the ankle, yet most operators use only a very few of these. If all of the muscles are paraiyzed there is obviously no use in operating for there is nothing to transfer, but when the muscles at the outside or inside or front or back of the leg are paralyzed and substitutes can be found for them, then tendon transfer is to be considered. The more nearly the transferred muscle approximates in function the one for which it is substituted, the better will be the result. For instance, one of the peroneal muscles makes an excellent substitute for the posterior tibial muscle, which is a plantar flexor, but a poor substitute for the anterior tibial muscle, which is a dorsal flexor. The operative results are not so good when flexors are substituted for extensors as when they are substituted for flexors. This is not, however, in the case at the knee when in paralysis of the extensor of the thigh the hamstring tendons may be carried forward with good results. If these are not available and the sartorius is active it may be sewed into the patellar tendon to supply extensor power. The general lines of procedure at the ankle have been already indicated.

In addition to infantile paralysis, for which at least eighty per cent of the operations are performed, the operation of tendon transfer has been done for the muscular disabilities resulting from injuries of tendons, overstretched tendons as in congenital club foot, in severe knee flexion contractions, from tuberculosis and "rheumatism," in spastic paralysis, in athetosis, in spinal spastic paralysis, syringomyelia, the muscular dystrophies, meningitis, meningocele, apoplectic hemiplegia, rhachitic flat foot, hallux valgus and pathological outward rotation of the leg.

Tendon transference is an operation within the reach of every surgeon who can do aseptic work and who will spend half an hour in studying the anatomical problem to be solved, with a text-book of anatomy by his side if he needs it, for few of us, except the specialists, keep distinct in our minds the exact location and function of the muscles about the ankle.

Nerve transference. Inasmuch as the nerves in anterior poliomyelitis show changes analogous to those occurring after the division of nerves and, as it is known that such nerves have the power of regeneration, it has been proposed to transfer to the paralyzed nerve some of the fibers or the whole of a non-paralyzed nerve and such operations have been performed. The proceeding is analogous to the transfer of tendons. At present the operation has hardly established itself as a recognized surgical procedure, being still in the tentative stage. Twelve cases of nerve transplantation are recorded by Murphy. In five there was improvement of motion in paralyzed muscles following operation. In three there was no improvement in motion. In the others no final report was possible.

A case of Murphy's will serve as an example. The anterior tibial and common extensor of the toes were paralyzed. The disease was of five years' standing. The internal and external popliteal nerves were anastomosed and the flexor tendons were elongated while the extensors were shortened. Great improvment in function resulted from the combined operation. It is probable that nerve anastomosis will prove an operation of value, especially as it

may be combined with tendon transfer.

Arthrodesis, or the formation of an artificial ankylosis, is an operation frequently performed in joints that have lost all power and that are useless on account of their instability. A paralyzed arm cannot be lifted from the side because the arm dangles from the shoulder and is not affected by movements of the scapula. If it is fixed to the scapula by an artificial ankylosis it will share in any scapular movements and thus acquire some motion.

The ankle in a flail leg is of little use in weight bearing and without a brace or tendon transfer walking will not be possible. If it can be made stiff, if motion at the ankle joint can be obliterated, a stiff but stable ankle results which will bear weight.

Arthrodesis of the knee can be done, but most patients will prefer to wear a brace, which will permit flexion of the knee in sitting, to putting up with the inconvenience of a stiff knee through life.

Arthrodesis of the hip is of use chiefly when it has become dislocated from joint laxity and a useless and unstable joint has resulted. It is not always successful in causing ankylosis.

The elbow and wrist may be stiffened when necessary, but the operation finds its chief use in the ankle.

Arthrodesis of the ankle should not be done in young children as very serious distortion of growth will sometimes follow. Nor is arthrodesis of the joint between the astragalus and tibia enough, for the other joints are likely to relax and abnormal mobility may return even with the astragalus firmly fastened to the tibia. When the operation is performed, not only should the joint between the astragalus and tibia be destroyed but also the joint between the astragalus and the os calcis and the astragalus and the scaphoid; in very relaxed cases the joint between the cuboid and os calcis should also be stiffened.

The operation consists of an incision exposing the joint and the removal of the joint cartilage from both surfaces of the articulation by a chisel or heavy knife. The wound is then closed and the joint fixed in plaster of Paris for two or three months.

Substitutes for arthrodesis have been offered in stitching tendons to bone and covering them with periosteum and in sewing strands of heavy silk from the tibia to the astragalus, thus attempting to obliterate ankle joint motion without opening the joint. These two latter methods are still *sub judice* and time alone will determine their value. If they prove of value they will supersede the removal of cartilage in this joint in children for it is easy to see that a very slight obliquity of the joint surface of the astragalus caused by the removal of more cartilage from one side than the other may, in the process of growth, produce in the adult a very serious distortion of the foot.

Arthrodesis, it must be remembered, is an operation to be done only in cases of complete paralysis when tendon transplantation is not available and it is done with a view to making apparatus unnecessary.

Such is the treatment of infantile paralysis as it exists to-day and it marks as much of an advance as does the progress in the treatment of congenital dislocation of the hip. Massage and electricity no longer constitute our best means of help but a line of definite surgical indications is met by a series of definite surgical procedures. Each case should be analyzed, operated upon if it can be helped and put on its best level by this means, or provided with suitable apparatus to make up so far as possible for paralyzed muscles. In either event, there is no room for lax, indefinite methods, for each case should be pushed, by modern means, to the fullest development of muscular power.

SOME PHASES OF THE SURGICAL TREATMENT OF CANCER—A CLINICAL LECTURE.*

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In accordance with the custom of the past few years, an annual clinic is held at the New York Skin and Cancer Hospital, for the purpose of reviewing the preceding year's progress in the study of cancer, and for the presentation of cases illustrative of certain phases of the treatment of this disease.

While the past year has been marked by no epoch-making discovery in the matter of causation or cure, it may be said to be a memorable one because of the meeting of the First International Congress on Cancer, held at Heidelberg and Frankfort, September 24 to 27, 1906.

From time to time the advisability of holding an international conference on cancer had been discussed, but many of the most earnest and active students of this great question shrank from the publicity which would so naturally follow a "congress on cancer," while others were of the opinion that the "cancer problem" was so far from being

* Abstract of third annual clinical lecture delivered at the New York Skin and Cancer Hospital, April 24, 1907.

solved that the individuals and institutions working for its solution had not enough of definite information to give to warrant such a meeting.

At last, however, the psychological moment seemed imminent. The great Heidelberg Institute for Cancer Research, the newest and one of the best equipped institutions for the treatment and study of cancer in the world, was about to be formally opened; and the Grand Duke of Baden, whose generosity and influence had largely made the hospital possible, was about to celebrate the fiftieth anniversary of his marriage to the Princess Luise. What more appropriate occasion could offer for holding an international congress on cancer! Our German colleagues, taking the initiative, conferred with other centers, and arrangements were perfected.

Thus it came about that more than four hundred men gathered at Heidelberg to witness the formal dedication to the study and relief of cancer of the Heidelberg Institute for Cancer Research, and for the purpose of taking, as it were, a concerted accounting of stock—to look back upon what has been accompuished in the past toward the solution of this problem, and to hold counsel concerning the campaign of the future.

It was in many respects a memorable conclave. From Germany, Austria-Hungary, Russia, Switzerland, Norway, Sweden, Roumania, England, France, Italy, America, Africa and Asia, came the four hundred and twelve accredited delegates, earnest seekers after truth, with the sole motive, apparently, of furthering that search. Behind closed doors, with even the medical press barred, they wrestled with the great unsolved problem of cancer, its causation, transmission and cure. There were differences of opinion, of course, but these were honest, and were discussed with no animadversion. It has never been my privilege to witness a conference pervaded by an atmosphere of greater sincerity and seeming honesty of purpose.

The members of the Congress were not unanimous as to the essential cause of cancer, nor were they agreed concerning the transmissibility of the disease, yet in the main all were agreed concerning the subject of treatment.

In a paper on "The Problems of the Curative Treatment of Cancer" (treatment by other means than surgery), von Leyden held that all attempts at curing cancer by therapeutic measures and sera have proved illusory, and that the surgeon's knife has brought, in the majority of cases, the only help in easily accessible tumors. Ledoux-Lebard, in a paper entitled "Fighting Cancer: Past, Present and Future," said success in the past had been marred by the opposition which had frequently been shown on the assumption that cancer is an incurable disease and that it was consequently useless to fight against it. This also accounts to a large extent, he said, for the withholding of private charity. Despite all the hindrances, however, the work of the last few years has shown, according to this writer, decided progress along the lines of etiological investigation, efforts at cure, and the amelioration of suffering in incurable cases.

The enthusiasm of the Congress was manifested by a vote to form an International Association for the Cure of Cancer, to meet at such time and place as may be determined upon in future.

The Heidelberg Institute for Cancer Research is equipped in the most modern fashion for the study and treatment of cancer. Its laboratories are convenient to the operating room, so that diseased tissues may be studied as removed, and its animal houses for experimental work are close at hand. While there are many things which would suggest themselves in the line of improvement, it is undoubtedly an excellent plant, from which, and from like institutions, much will be expected in the future. In the addition soon to be made to the New York Skin and Cancer Hospital it is proposed to embrace many of the excellent features of the Czerny Hospital and others of similar character, thus rendering it not only the newest but, we hope, the best equipped cancer hospital in the world.

From the abundant material at our command we have selected, without attempt at classification, a number of patients to present to-day, whose cases illustrate the results of certain phases of the treatment of cancer by surgical means.

CASE I.—*Epithelioma of Lower Lip.* J. L., male, aged 86, Irish, lumberman. About eight months before admission to the New York Skin and Cancer Hospital, a small lump appeared on the lower lip, midway between its center and the angle of the mouth. This, together with a wedge-shaped piece of the lip, was removed under cocain anesthesia. Five months later recurrence took place, first within the oral cavity, then on the lip. This developed rapidly, until, upon admission to the hospital, February 18, 1907, it extended from the median line to the angle of the mouth and into the oral cavity for about ½ inch, the tumor being about the size of a hen's egg. No glands were palpable. The condition of the mouth was very fetid, and the patient was constantly swallowing cancerous material. The mass was removed under cocain. On account of the patient's extreme age and his physical condition it was not deemed justifiable to give a general anesthetic and to explore the neck. The wound healed

uneventfully, and the patient was discharged in good condition. No recurrence to date. The general condition of the patient improved markedly after the operation, and he is as active and well as most men of eighty-six years.

Pathological report: Epithelioma, very malignant.

CASE II.—*Epithelioma of Superior Maxilla.* J. M., male, aged 51, Italian laborer. Six months before admission to the hospital the alveolar process of the superior maxilla presented several swellings, some of which became confluent, forming a large fluctuating mass in the buccal cavity. This was twice opened as an abscess. The patient suffered continuously from pain in this locality, from headache, and from loss of flesh and strength. When admitted to the hospital, March 18, 1907, a large cauliflower mass was found on the left half of the upper jaw, extending from the alveolar border up to the eye, and filling the entire buccal cavity. The mouth was in a fetid condition. Two sinuses led down into the bone.

Operation, March 22, 1907. Typical excision of the left half of the upper jaw, with a large part of the soft tissue of the cheek. The cavity was packed with gauze saturated with shellac,* and the parts closed. The wound healed by primary union. The patient was subsequently sent to the New York College of Dental and Oral Surgery to have a temporary plate fitted.

Subsequent history: Before the temporary plate was fitted rapid recurrence took place on the opposite side. Opposite maxilla removed, May 14, 1907. He was then sent to have plate fitted. This was done and patient was apparently in good condition, but after a few weeks rapid recurrence of the most malignant character occurred.

Pathological report: Epithelioma.

This case is an excellent illustration of the rapidity of recurrence following the serious error of incising a malignant growth, mistaking it for an abscess.

CASE III.—*Epigastric Entero-Epiplocele.* J. M., male, aged 43. About seventeen years ago this patient noticed a small lump in the upper part of the abdominal wall, which he attributed to overeating. The lump slowly increased in size for two years, since which time there has been no increase. It was not painful. "A feeling of weakness in the upper part of the abdomen, with indigestion," caused him to consult a physician. The weakness had become so marked that he was unable to perform his daily work. When he attempted to work he experienced pain in the abdomen, and a feeling of weight or discomfort, with nausea,—very much the symptoms of chronic ulcer.

When he was admitted to the New York Polyclinic Hospital, January 24, 1907, a tumor, the size of an English walnut, was found in the median line, two inches above the umbilicus. This was not tender, and the skin was freely movable over the mass. Upper part of tumor irregular in outline, rather hard, and irreducible; lower part soft and partially reducible. A median vertical incision was made and a hernia of small intestine and omentum found through the opening in the linea alba. The omentum was twisted into an irregular mass and firmly adherent around the upper margin of the opening. The omentum was removed, the sac ligated, after reduction of its contents, and secured to the right side of the linea alba behind the rectus. The patient made an uneventful recovery, and there has been no return of the symptoms and no recurrence of the hernia.

It is often a small lipoma on the external surface of the peritoneum which starts this form of hernia. This case illustrates what is referred to by Bland-Sutton as the "baneful effects of innocent tumors." Structurally benign tumors may, in certain environment, become clinically malignant, even eventuating in death.

CASE IV.—*Carcinoma of Wrist, involving arm and axillary glands.* Mrs. E. G., aged 77, housewife. The present trouble began four years ago as a "wart" on the back of the right hand. Two

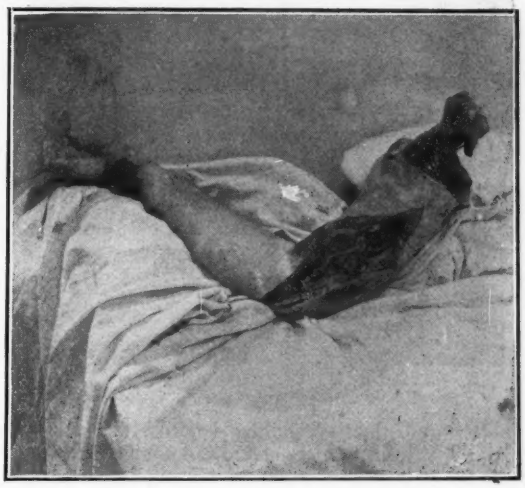

Fig. 1.—Case IV.

months before admission to the hospital, May 31, 1906, a swelling was noticed just above the internal condyle of the humerus, which was tender and swollen. Examination upon admission revealed an ulcerating lesion over the styloid process of the ulna. Just above the internal condyle of the humerus was found an indurated mass, oval in shape, immovable, the induration extending for about five inches vertically and about four inches transversely. This was of a purplish color, and painful.

On June 2, 1906, the right arm was amputated at the shoulder joint, Wyeth's pins being employed. The entire upper extremity, including the contents of the axilla, was removed, the operation, from its commencement to the complete removal of the upper extremity and the securing of the main vessels, con-

* Author's modification of Whitehead's shellac, consisting of twice the strength of compound tincture of benzoin, with nosophen or aristol instead of iodoform. This tends to hold the parts in position and makes a very good antiseptic dressing.

suming one and one-quarter minutes. Recovery was uneventful, and the patient was discharged cured. No recurrence. (Figs. 1 and 2.)

Pathological report: Dr. Martha Wollstein of the Rockefeller Institute reported as follows: "Very hard, white mass just above the elbow on the outer surface of the arm, the skin being unbroken. The mass measured 6 inches long by 3 inches wide. The skin, fat, fascia, and muscle are involved, but the bone is free. There is an indurated ulcer on the posterior surface of the wrist, near the inner border; the fascia beneath is fee. Microscopic examination: 1. Ulcer at wrist—early stage of epithelioma. 2. Mass on arm—epithelioma infiltrating subcutaneous tissue deeply; but the muscles are the seat of inflammatory infiltration only."

Fig. 2.—Case IV.

The extreme age of this patient, and the extensive involvement, rendered amputation the only hope of cure. Hemorrhage was perfectly controlled by the Wyeth method, and this, together with the rapidity of the operation, minimized the shock and facilitated recovery.

CASE V.—*Round-celled Sarcoma—Osteosarcoma—of Right Forearm.* W. R., male, aged 4½ years. The child was healthy until a year before admission to the hospital, June 5, 1907, when the mother began to notice that he cried and complained of pain in the arm below the elbow. Three months before admission he was examined by another physician who, seeing no external signs of injury, diagnosed the condition periostitis, and prescribed an iodine ointment. A week before admission the arm swelled rapidly, the pain becoming continuous and severe. He was then seen by Dr. Emil Bruno, who made a fluorscopic examination, finding the radius and ulna, from the olecranon process to the middle of the forearm, thickened and infiltrated. There being no history of tuberculosis in the family or in the child, and inasmuch as there was no abscess formation, he concluded that the condition was due to some malignant process, and referred the case to me for operation.

Operation was performed on June 7, 1906, when the right arm was amputated at the shoulder, with the use of Wyeth's pins, and Larry's external racquet incision. Time of amputation, forty-five seconds. The patient was discharged, cured, and is in good condition. No recurrence. (Fig. 3.)

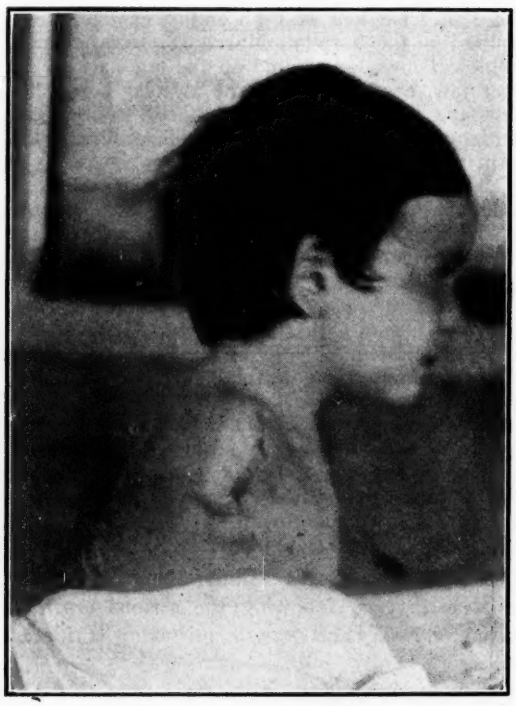

Fig. 3.—Case V.

Pathological report: Dr. Martha Wollstein reported as follows: "The inner portion of the forearm was laid open by an incision, and revealed a nodular, whitish, softened mass extending from an inch above the wrist to an inch below the elbow. The ulna is eroded over an area two inches long, the probe entering the softened bone substance readily. Muscles and fascia infiltrated by the tumor masses. Microscopic Examination: Small round-celled sarcoma, with irregular spicules of bone present. Diagnosis, osteosarcoma.

CASE VI.—*Multiple Lipomata of Arms and Forearms; Adenocarcinoma of Left Breast; Tuberculosis of Left Breast; Fibro-cyst-adenoma of Right Breast.* A. L., female, widow, aged 43. Eighteen

years ago a small nodule appeared on the left arm, since which time others, to the number of thirty-five, have appeared in different localities on the arms and forearms. No treatment previous to admission to the hospital. When admitted, in addition to the thirty-five lipomata, a tumor, the size of a hen's egg, was found in the left breast, midway between the sternum and the nipple, and attached to the skin. In the right breast were two nodules, each about one-half inch in diameter, freely movable and not attached to the skin.

On April 2, 1906, a modified Halsted operation was performed on the left breast, and nineteen lipomata were removed from the left arm and forearm.

On November 14, 1906, one lipoma was removed

Fig. 4.—Case VIII.

from the left arm and fifteen from the right arm. From the substance of the right breast the nodules were excised. The axillary glands were not involved. The wounds healed by primary union. No recurrence.

Pathological report: Multiple lipomata of arms and forearms; adenocarcinoma of left breast, on a basis of extensive tuberculosis; fibro-cyst-adenoma of right breast, with no evidence of tuberculosis.

CASE VII.—*Sarcoma over Left Scapula.* M. E., female, married, aged 65. A sister died of cancer; mother died of abdominal tumor of unknown character. Twelve years before admission to the hospital the patient fell, bruising the left scapula. Ten years later a lump appeared at the site of the old bruise, increasing within a year to the size of a goose egg. This was excised by another surgeon on April 1, 1904. One year later the lump returned, gradually increasing until it measured ten inches in length and six inches in width.

On October 31, 1905, the entire mass, all lymphatic vessels and glands in the axilla and contiguous to the tumor, with the muscles in juxtaposition to it, were removed. The wound healed by primary union, and the patient was discharged in good condition. She remained well for nearly a year, when she noticed a recurrence above the old scar and in the axilla. She was again admitted to the hospital, and on October 29, 1906, a second operation was performed. The tumor, with both the superficial and deep fascia, also the fascia for one and one-half inches around the nodule, were removed. The

Fig. 5.—Case VIII.

axilla was cleared from behind, through the incision over the scapula. No bone was removed. No recurrence since second operation.

Recurrence in this instance took place in the deep fascia, the importance of which tissue, particularly with reference to cancer of the breast, has been emphasized by Handley, of the Middlesex Hospital, London, in a recent very able report.

CASE VIII.—*Carcinoma of Nose and Cheek.* K. S., widow, aged 60, scrubwoman. Grandfather had carcinoma of the mouth. About fifteen years ago the patient went to one of the large hospitals in this city and had an ulcer the size of the finger nail removed from the side of the nose. The area was covered with a skin-graft taken from the leg. Nine years ago three small nodules appeared in the upper left eyelid and one on the forehead on the same side. These four tumors were removed at another hospital, and the patient remained free from the disease for about two years. Eight months before admission to this hospital, an ulcer, beginning as a

"wart," appeared at the inner canthus of the left eye. This was treated in a third hospital with the X-ray, with apparently much benefit.

When admitted to the hospital, June 27, 1906, a mass, about the size of a walnut, was found between the orbits and extending to the frontal region and down over the nasal bones. It was hard, red, immovable, not tender, attached to the skin, and ulcerating on the left side. The patient complained of pain, interference with the vision of the left eye, itching of the part affected, and dizziness.

On July 5, 1906, Dr. Edward W. Peet, in my absence from the city, operated, completely enucleating the left eyeball, and curetting away the affected tissues around the orbit and well up into the frontal sinus. The inner wall of the orbit was chiseled away and the posterior nares exposed. The wound was packed with iodoformized gauze, the outer edges of the incision adjusted, and a heavy dressing applied.

On September 7, 1906, Dr. Peet again operated, taking from the left upper arm a quadrilateral flap about two and one-half by three inches, consisting of skin and subcutaneous tissue. The arm was thrown over the head, the flap adjusted to the freshened edges of the orbital opening, and sutured in place, and the head and arm encased in a plaster-of-Paris splint. On September 18th, the splint was removed, the flap cut from the arm, the lower edge of the orbital skin surface freshened, and to this the flap was attached. (Fig. 4.) On November 17th, the lower edges of the flap were freshened and loosened. A recurrent involvement in the soft tissues near the inner canthus was dissected out. Drainage was placed well up in the orbit through the nose. The freshened edges were adjusted, and dry dressings applied. The patient was discharged December 21, 1906, in good condition. (Fig. 5.) She has continued perfectly well since, with no recurrence.

The area covered by the skin graft, being whiter than the surrounding skin, was stained with mahogany stain, according to the suggestion of Dr. L. Duncan Bulkley.

CASE IX.—*Multiple Fibroids of the Uterus.* J. F., female, colored, single, domestic, aged 38. Doubtful history of syphilis at 21. When the patient was twenty-three years of age another surgeon performed a myomectomy for the removal of a fibroid tumor. For a year previous to admission to the hospital she had suffered from menorrhagia, and for three weeks previously she had complained of continuous pain in the epigastric region, of constipation, frequent micturition, and vaginal discharge. When admitted to the hospital, December 13, 1906, bimanual examination revealed a mass which filled the entire pelvis. There was no abdominal hernia in the scar.

On December 19, an incision four and one-half inches long was made in the median line, about one-half inch from the scar of the previous operation. The old scar was completely excised. Many adhesions were found between omentum and abdominal wall, between small intestine and uterus, and between bladder and uterus. With the many adhesions there was the main band, made up of omentum, which was attached to the uterus below and to the lower abdominal wall in the line of the old scar, and which had been so pulled upon as to bring the greater curvature of the stomach down to within two inches of the pubes. The surgeon who performed the myomectomy had evidently pulled the omentum down into the pelvis to cover the raw surfaces resulting from the myomectomy, as is the custom with many surgeons. When this is done, care should be taken not to draw it too far down, and also not to include it in the abdominal wound. The symptoms caused by the gastroptosis which resulted from this procedure were much more severe than any caused by the fibroids found at the second operation. Supravaginal hysterectomy was done, the stump of the cervix which was left being covered with peritoneum. The stump of the appendix was removed. It was about an inch long, and looked as if the rest of the organ had been previously amputated. The patient made a good recovery, and was discharged, in excellent condition, January 21, 1907.

CASE X.—*Uterine Fibroid.* M. K., female, aged 50, writer. Maternal aunt had abdominal tumors of unknown character. The patient first noticed recurrent abdominal pain, then gradual enlargement of the abdomen. Pressure discomfort marked; menorrhagia. For five months she had received electrical treatment, with no benefit. Shortly before admission to the hospital the tumor began to increase rapidly. Upon admission, May 20, 1905, the abdomen was distended by an enormous tumor, causing distressing pressure symptoms. Mobility of the uterus was difficult to determine. The patient was very small, weighing only 85 pounds when admitted.

On May 22, 1905, a median incision was made, extending to the left and above the umbilicus. The uterine body was found to be adherent, except at the apex. Curettage, and then supra-vaginal hysterectomy were performed. The appendix was removed. The tumor was found to be adherent in the left side all along the margin of the pelvis, over the left external iliac vein, so that separation was effected with great difficulty. Adventitious veins had to be tied off, and a running suture in the sheath of the iliac vein, for over an inch, had to be employed to hold these in place. The wound healed by primary union and the convalescence was uneventful. The patient was discharged in good condition, and has been well since. The tumor weighed nineteen pounds.

This case furnished another illustration of a tumor, structurally benign, fast becoming clinically malignant. Continuance of the pressure would without doubt have eventuated in early erosion and perforation of the external iliac vein and death from hemorrhage.

CASE XI.—*Carcinoma Uteri.* F. S., female, married, aged 38, housewife. Admitted to the hospital

April 9, 1907, suffering from irremovable cancer of the uterus.

On April 15, 1907, the cervix which was as large as a mandarin orange, was curetted away, the fundus curetted and packed with iodoformized gauze. An incision three inches long was then made in the median line, just above the symphysis pubis. The bladder presented upon exposure of the peritoneum, being forced into this position by the tumor below. The uterus was bound down to the rectum, making it impossible to reach the uterine arteries at their origin. The disease had extended well into the broad ligaments on both sides. The ovarian arteries were tied off, each close to its respective ovary. A ligature was then placed in the broad ligament on each side, so as to include the uterine artery as it approaches the lower part of the uterine body. The left ovary and tube were removed because of cystic condition. The patient was subsequently discharged, much improved, and is now on the enzyme treatment.

This case illustrates the possibility of prolongation of life by radical procedure; and also the provision of an opportunity for legitimate experimentation with new remedies. The hemorrhage was perfectly controlled by tying off the uterine and ovarian arteries.

CASE XII.—*Sarcoma of Breast and Axilla.* Miss F., teacher, aged 65. Father died of "heart failure" and inanition, the latter due to some undiagnosed condition of the stomach (probably cancer). Mother died of apoplexy. Six years ago the patient had rheumatism which lasted about a year. In 1892, "nervous prostration." The present trouble dates from December 31, 1905, when she first noticed a lump the size of a hazelnut in the left breast, near the nipple. This was quite tender. Two weeks later she consulted the family physician, who recommended removal of the breast. She then consulted a surgeon, who removed the breast, but failed to clear the axilla. Two months later (April, 1906), there was a recurrence under the arm. This grew rapidly. On March 5, 1907, she consulted a physician, who opened the tumor, then about the size of an orange. Four days after the growth was incised the patient had severe hemorrhage. The bleeding would cease for a day or two after the application of a dressing by the nurse, then would begin again. On March 22, 1907, she consulted Dr. E. M. Mosher, of Brooklyn, who referred the patient to me. She was then admitted to my service at the New York Skin and Cancer Hospital.

Operation, March 26, 1907. The subclavian artery was ligated in its first portion through an incision above the clavicle. The immense ulcerating mass in the axilla was curetted away, this being done as a palliative measure. The patient would undoubtedly have died of hemorrhage within a few days, as the ulcerating mass involved the axillary artery. This was circumvented by tying above. The patient was thus made sufficiently comfortable to allow of her being moved to a private sanitarium on Long Island, where she was in the open air, and where her last days could be made as comfortable as possible.*

This case illustrates several important points. First, the importance of removing all lymph vessels and nodes contiguous to a malignant process. Had the surgeon who removed the breast performed a radical operation, clearing the axilla thoroughly, he would have had an excellent chance of saving the patient all subsequent trouble. Second, the evil consequences of the incision of a malignant tumor, as was done by the second surgeon, thus opening up new avenues of infection, and incurring the risk of hemorrhage. Third, the control of hemorrhage by ligating the subclavian artery, thus prolonging life.

CASE XIII.—*Epithelioma of Lip and Glands of Neck.* J. L., male, aged 62. About thirty-five years ago the patient was bitten on the chin by a horse. The scar resulting from this wound is still visible, near the middle line, about on a level with the alveolar border. About five years ago the patient noticed a sore on the right side of the lower lip. This was indurated, tender and painful. He was admitted to the hospital December 28, 1906. On December 30th, the mass, about the size of the end of the thumb, on the vermillion border, was removed, together with a V-shaped section of the lip. The glands of the neck, including the submaxillary, were removed. The wound was closed and protected by my modification of Whitehead's shellac. Recovery uneventful; no recurrence.

Pathological report: A pathologist of prominence reported the specimen to be absolutely non-malignant. Clinical evidence of malignancy being so apparent, I requested further examination of the specimen. A number of additional sections were examined, with the final report of undoubted malignancy.

This case emphasizes the fact that one should not lean too heavily upon clinical evidence of malignancy upon the one hand, nor upon pathological findings upon the other. The clinical evidence of malignancy in this case was conclusive, yet it was only after careful and prolonged search that microscopic evidence thereof could be found.

CASE XIV.—*Extensive Carcinoma of Tongue and Neck.* M., male, aged 52. This case was reported *in extenso* in the *Atlanta Journal-Record of Medicine*, June, 1905, and elsewhere, and the patient has been presented before a number of medical bodies. He is presented again merely to emphasize the fact that extensive carcinoma, necessitating the removal of the entire tongue, and all the glands of the neck, can be so thoroughly eradicated by surgical means that the patient not only lives (though several times reported in the newspapers as dead), but passes the three-year limit of recurrence, marries in the meantime, becomes the father of a healthy child, and is to-day a well, strong, and happy man, eating anything he chooses, talking, smoking,—in short, as he says himself, doing "anything anybody else can do."

* She died May 24, 1907.

THE FREQUENT INTERDEPENDENCE OF DISLOCATED KIDNEY, GALL-BLADDER TROUBLE AND APPENDICITIS.

EARL HARLAN, M.D.,
CINCINNATI.

The status of dislocated kidney as a pathological lesion, capable of creating any symptoms or conditions which demand interference for their relief on the part of the surgeon, was exceedingly indefinite, up to within the last two years. So long as such men as Treves, Hare, Osler, Baldy, and others of equal rank, held to the belief of the minor importance of this lesion as the origin of serious pathology, just so long would the rank and file of the profession continue to grope in the medical cellar without a candle.

But the incessant efforts of the enlightened few, *e. g.*, Suckling, of England, Harris, of Chicago, and Goelet, of New York, marked the dawn upon the medical profession and precipitated a deluge of the awakened ones into this field of study. The recognition of the serious import of dislocated kidney as a pathological lesion was sudden, universal and spontaneous; relentlessly overriding the skepticism that always obtains in the mind of the uninformed. And now there remains but the empty wail of dogmatic assertion by those who will not see, in the maintenance of their skepticism. The skeptics, however, are not to be entirely condemned for their position; they merely justify the old saying, "a little knowledge is a dangerous thing," and I shall attempt to indicate further on wherein they obtained the foothold for their position.

A close study of this subject for ten years by the writer has revealed many points of interest and details of especial value in the diagnosis and classification of these cases for successful treatment.

To begin, I would state that I have never seen a dislocated kidney, accompanied with symptoms of the many and varied pathological and mechanically pathological conditions which are liable to come with this lesion, make a correct recovery without operative treatment. I have had a number of patients seek relief at my hands who had been operated upon for gall-stones, appendicitis or some pelvic trouble, wherein the causative lesion, dislocated kidney, had gone unsuspected. I have made this mistake myself, and upon one occasion operated for gall-stones when a dislocated kidney was at the bottom of the trouble. Dislocated kidney was suspected, however, in this case, but the diagnosis was obscured on account of the downward projection of an elongation of the liver, the latter overriding the kidney. I duplicated this mistake in the anatomical laboratory upon an occasion when I was demonstrating to Dr. Albert Faller, Superintendent of the Branch Hospital, Cincinnati, the technic of the writer's anterior operation for dislocated kidney.

In this connection, I wish to submit to the Society my classification of dislocated kidney, which will aid in its successful management, from the standpoint of treatment, will help to elucidate the position of the skeptics, and at the same time will justify the assertions of those who maintain the seriousness of dislocated kidney as a pathological entity. This arrangement is not new, it having been presented to the profession by the writer on former occasions.

In seeking for tenable ground in this classification, I arranged these cases under two headings: First, those in which the kidney is easily palpable and freely movable, and in which the patient complains of *no symptoms.* Second, those in which the kidney is movable or out of position, and in which the patient complains of nervous or abdominal symptoms, be they definite or indefinite.

Briefly, the patients who have movable kidney may be divided into: First, those who suffer, and, second, those who do not suffer. The first class of cases should be let alone, while the second class of patients should be submitted to operation. The earlier the latter is done, the better for the patient, for, I repeat, I have never seen the pathology of dislocated kidney clear away under medical treatment. I have seen them vastly benefited or entirely relieved as long as certain lines of treatment were carried out, but the instant the treatment was left off the suffering returned.

I do not quite agree with Suckling, Carstens and others, who say that: "Every kidney which can be felt is a movable kidney, and should receive operation," although I do believe that nearly every case of freely movable kidney results in the pathological movable kidney. Suckling has done much to clear away this point in a startling brochure upon "Insanity Produced by Dislocated Kidney," in which he proves this lesion the direct cause of insanity and cured twenty-one cases by correcting the dislocations by operation. This is a most remarkable contribution, but absolutely true. Pope, of Louisville, sustains the assertions of Suckling, his own work along parallel lines having corroborated them. The writer believes that insanity *may be* produced by this lesion, but has seen no case directly traceable to it.

In the above classification I have applied the term

movable kidney to all cases of the first order, *i. e.*, those cases in which the kidney is freely movable and easily palpable, and in which there is no clinical symptomatology and pathology, therefore requiring no operative interference; and the term *dislocated kidney* to all those cases in which there is distinct clinical evidence of abnormal conditions, namely, of functional and physical distress. The first division are non-operative cases, in contradistinction to the second division, which have a distinct pathology and demand operation.

It is the frequency with which the skeptic has come into contact with the first class of freely movable kidneys that has perhaps prejudiced him against its existence as a pathological entity at all; for it is a well-known fact that only a small per cent., about three to five, of movable kidneys are *pathologically* movable, and, therefore, demand operation.

It is the last division of these cases with which this paper purports to deal.

A pathologically dislocated kidney is "A cause of insanity, headache, neurasthenia, insomnia, mental failure, and other disorders of the nervous system; also a cause of dilatation of the stomach." (Suckling, of Birmingham, in his book on "Movable Kidney," published by Lewis, of London.) It is also a cause of gastric and intestinal indigestion, constipation, diarrhea, colitis, *"partial obstruction and acute obstruction."* (See "Partial Intestinal Obstruction —Its Causes, Symptoms and Surgical Treatment," by the writer, *Lancet-Clinic,* May 18, 1907.)

The following paragraphs taken from a paper by the writer, entitled "Visceral Ptosis—Its Surgery," read at the meeting of this Society two years ago, and published in the *Lancet-Clinic,* December 9, 1905, will serve as an argument on the combined pathology of a pathologically dislocated kidney.

"The particular features accompanying dislocations of the kidney—the right one, as it is in nearly all cases the one affected—and the ones which I wish particularly to emphasize, are the violent symptoms on the part of the nervous system, gastrointestinal tract, especially the stomach, gall-bladder, bowel and appendix. In kidney dislocation there is a prolapse of the duodenum into the canal of dislocation. This dragging gives rise to beginning symptoms of indigestion, fermentation and hyperchlorhydria, followed by lowered nutrition, perverted metabolism and consequent extreme nervous derangements, etc. As the kidney becomes further displaced the duodenum is correspondingly involved, following the kidney further in its course, and finally producing sufficient traction upon the pyloric end of the stomach to seriously impede the circulation in, and function of, both the duodenum and stomach, thereby interfering with the nourishment of the latter organ by damming back the blood supply and causing passive congestions and consequent conditions, giving rise to ulcer and various other inflammatory and congestive lesions by the venous stasis therefrom. Atony of the stomach is hereby produced from the beginning, with resulting sagging and dilatation of the latter, and its consequent ptosis.

"The gall-bladder usually comes in for a large share of the pathology produced by dislocated kidney. There is pressure obstruction to the bile outflow, causing attacks of jaundice, the latter having often led to the diagnosis of gall-stones, while an incision reveals nothing, not even a diagnosis, as the kidneys when dislocated usually seek their normal location when the body is in a reclining posture.

"Prolapse of the duodenum into the track of a dislocated kidney may also kink the common bile duct and produce this condition, as likewise many a dislocated spleen, by traction upon the greater end of the stomach, with consequent dragging upon the pylorus and duodenum, causing a like obstruction to the flow through the cholecyst or common bile duct. Cholecystitis, with localized peritonitis and consequent adhesions is produced.

"Appendiceal irritation and appendicitis are lesions caused by dislocated kidney, the congestion produced by pressure obstruction to the return circulation of the mesentery frequently resulting in severe and chronic appendiceal colic of setting up acute attacks of appendiceal peritonitis. Several of these patients have come under my observation, as well as others suffering from this trouble who had been operated upon primarily for appendicitis, the real nature and origin of the trouble having gone unrecognized and undiagnosed, with a continuation of the symptoms to a large extent; however, removal of the appendix in cases of dislocated kidney, where this organ is seriously involved, will relieve symptoms on the part of the bowel to a certain degree."

Partial obstruction to the bowel above the cecum, or in the neighborhood of the hepatic flexure, is a complication not to be overlooked.

In support of the above arguments for the pathology of dislocated kidney, I wish to cite, briefly, the following clinical presentations:

CASE I. Male, aged about 50 years, salesman. He had been operated upon for appendicitis twelve years prior to the time he consulted me, but his symptoms continued about the same as they were before operation. I saw him in September, 1904. He complained of attacks of extreme nervousness followed by reactions of languor and stupidity. There were loss of appetite, indigestion and constipation, abdominal distress and discomfort referable particularly to the right side. A dull aching pain occurred at times in the right hypochondriac region, with a dragging sensation of weight. Colicky pains of an annoying but not acute nature were present at times in the appendiceal region.

Physical examination of the abdomen revealed some distention, tenderness on pressure over the appendix, cecum, ascending colon and hepatic flex-

ure, and distention of the colon to the latter point. A movable tumor was felt in the right lumbar region, which glided up beneath the liver when compressed by the hand. Dislocated kidney was the easy diagnosis, and operation was advised.

CASE II. Robust, well-developed female, aged 28. She presented herself for examination in November, 1905. Prior to her then state of good health she had suffered from pelvic trouble, having been curetted three times for the relief of the latter. She had been incised for gall-stones and none found. Her symptoms continued just the same after the latter operation. There were recurrent attacks of torpid liver, with indigestion and constipation. These were followed by jaundice of a mild nature. During these attacks there were eructation of gas, and abdominal distention, discomfort and distress. Abdominal distention of the right colon, with tenderness on pressure. A kidney-shaped tumor, freely movable, was rather indistinctly mapped out in the right lumbar region, the latter gliding upward beyond the range of touch when grasped. Dislocated kidney, with pressure obstruction to the bile outflow, was diagnosed, and operation advised. The patient afterwards disappeared from observation.

CASE III. Stout, robust, well-nourished male, aged 29. A diagnosis of appendicitis had been made by the local surgeon, and the patient was sent to me from Alabama for consultation and examination. He presented a classic study in dislocated kidney of the first degree. Delay of operation was advised, and the patient has not since been heard from.

I wish to state here that the above three abdominal cases were sent to me by the surgeon in charge for diagnosis only.

CASE IV. Stout, robust, well-nourished male, aged 51 years. He had for years suffered from attacks of gastrointestinal indigestion, for which he had been treated now and again, but obtained no relief. There were abdominal distention and distress, with recurrent accumulations of stagnant gas in the cecum, ascending colon and hepatic flexure. There were also present at times a dull, dragging sensation of weight, and aching deep in the right lumbar region. There were recurrent attacks of light colic in the region of the appendix and cecum, with other symptoms of irritable appendix. There was tenderness over the gall-bladder on pressure. A freely movable, kidney-shaped tumor was felt in the right lumbar region, gliding upward on pressure. At times pain radiated from the region of the liver over toward the stomach. There was no jaundice. I suspected both dislocated kidney and gall-stones, with involvement of the appendix, and made the regular incision for cholecystotomy. There were no gall-stones. The kidney was slightly dislocated, but could not be corrected through the gall-stone incision, and the appendix seemed in fair shape, but somewhat congested. The latter would have been removed, however, had there not been present a severe and persistent rigidity of the abdominal wall, making work through the gall-stone incision impossible. There was also an elongation of the liver, kidney-shaped, extending downward in front of the kidney, and moving upward with the latter upon being grasped with the hand externally. The operation amounted simply to an exploratory incision. The patient was afterward placed upon a laxative tonic, and an abdominal elastic carefully fitted; and he entirely recovered from his symptoms, none the worse for the exploratory incision.

CASE V. Woman of 18 years, of slender figure, but fair health and vitality. A misstep, followed by a precipitate fall, produced an acute pain in the right side, with a sensation of something heavy having torn loose beneath the ribs, and thrown itself downward. The patient was seen two weeks after the accident. There were considerable abdominal pain, tenderness in the right hypochondriac and lumbar regions, some distention, indigestion and constipation; and a general condition of distress, coming from the indefinite and uncircumscribed abdominal discomfort. A freely movable renal-shaped tumor was easily palpated in the right side, and the diagnosis of dislocated kidney was made. Operation was advised, but the parents objected. The patient fell into the hands of her family physician, who scouted the idea of dislocated kidney. Another surgeon saw the case, and the diagnosis of appendicitis was made, and the patient was operated upon accordingly. This procedure afforded no relief, the symptoms continuing as before. Nothing further has been done, and what the future may develop I do not know.

A number of other cases might be cited, but the above are sufficient to emphasize the purpose of the paper, whose salient features may be briefly paragraphed as follows:

1. That, as dependent pathology, accompanying the primary lesion of dislocated kidney, gall-bladder trouble and appendiceal irritation of a severe nature are of frequent concomitant occurrence.

2. That many cases have undergone operation for appendiceal or gall-bladder trouble where the causative factor was a dislocated kidney, the latter producing pressure interference to the pile outflow or bowel current.

3. That all cases presenting for abdominal treatment, complaining of indefinite and recurrent distress, discomfort and pain, these attacks being accompanied with the presence of an excess of stagnant gas at certain tender points in the bowel, and in which the involvement of the stomach, gall-bladder and appendix are more or less equal, should receive the most careful and repeated consideration from the physician, in order that a distinct differential diagnosis may be concluded.

4. That in the vast majority of instances, a freely movable kidney presents no pathology on the part of the organ itself, and that this immunity may cover

a considerable space of time, after there appear symptoms of functional and mechanical disturbance on the part of the stomach, cholecyst and bowel.

5. That, on account of the wide, uncircumscribed range of pathological symptoms produced by a dislocated kidney, it is more often liable to proceed undiagnosed than any other symptom-producing abdominal lesion.

6. That permanent and complete relief result only from a correction of the primary lesion with its dependent pathology.

THE SKIAGRAPH AS AN AID IN THE DIAGNOSIS OF TUBERCULOUS BONE LESIONS, WITH ILLUSTRATIVE CASE REPORTS.

A. JACOBY, M.D.,
NEW ORLEANS.

The early diagnosis of the tuberculous bone lesion is a very important matter. Indeed, an early diagnosis in cases of bone disease is just as important as it is in tuberculosis of the lung. In the former it will mean a speedy recovery of the patient with a useful limb, while in the latter it means a rapid and positive eradication of the diseased process in the lung. Furthermore, skiagraphy will aid in clearing up many "sprained joints" which are not yielding to treatment, as well as the painful bone cases in which we are not sure of the location of the diseased process.

Those who have occasion to operate upon a case of chronic bone disease and have thus learned the extent of removal of bone required, the long and tedious convalescence, and the frequent impairment or complete loss of use of the limb will appreciate the aid the skiagraphy offers in these cases. It will show to the practitioner how early these cases can be brought to the attention of the surgeon and how it will very quickly clear up the diagnosis in doubtful cases. For the patients will be relieved of repeated curetting of new foci and packing the sinuses, for the x-ray will show that there is more work to be done than appears on the surface. It offers to the surgeon the means of determining the extent of the diseased process and of the operative work necessary to cure. And it affords a fair basis for prognosis in each case.

Of the three following cases two demonstrate the aid received in the diagnosis of early cases, and the other shows the extent of the diseased bone upon which we might operate indefinitely without securing a result. For how often and how long have doctors trifled with the chronic bone cases without any result before sending them to a surgeon for further operative work and possible cure! The skiagraph would have shown them the folly of the frequent curetting which they had given the bone, by reason of the multiple foci pictured along its course. The illustrations here reproduced are from positives, and the bone details do not show as clearly as in the corresponding negatives.

CASE I.—O. B., aged 17 years, was admitted to the hospital on Sept. 24, 1906. Six weeks previously he had presented himself at my clinic for a painful condition of the left knee.

The family and personal history was good. Five weeks before consulting me he had jumped off a car and had jolted his knee. A short time after

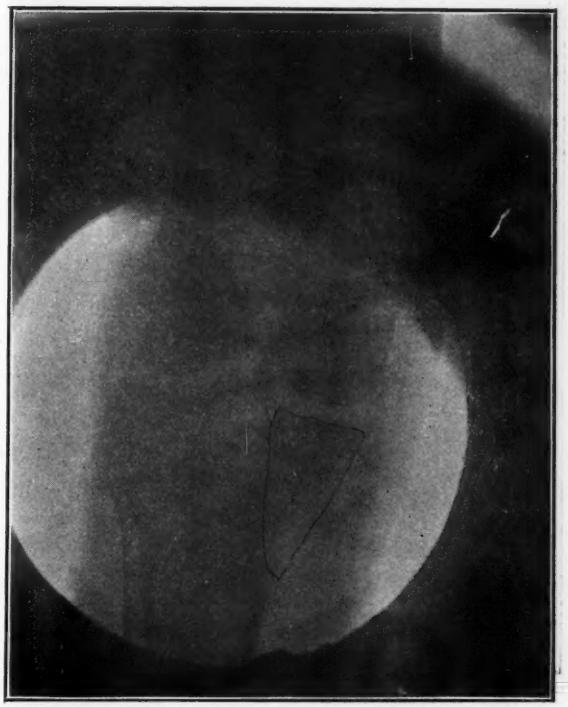

Fig. 1.—Case I. Tuberculous Focus in the Head of the Tibia.

the occurrence he knocked his knee with a piece of stone and two days later his leg at the knee became swollen and quite painful. His family physician was called and he was ordered to bed and cold applications applied. As he did not improve sufficiently, he came out to the hospital for further advice and treatment.

Examination of the knee revealed some tenderness and he was found to have a temperature of 99.6° F. The knee was encased in plaster of Paris and the patient was told to return in three weeks, but earlier if he suffered. Upon his return I found

his temperature 99° F., but the knee was so much improved that another cast was applied and he was told to return again in three weeks. In the meantime the patient was instructed to remain outdoors most of the time and to drink plenty of milk with raw eggs. He was also given syrup ferri iodid, a teaspoonful three times daily. Upon his return, examination of the knee showed increased tenderness and his temperature was 100° F. I then had a skiagraph of the knee made by Dr. Amedeé Granger, and found a tuberculous focus on the inner side of the head of the tibia, which focus seemed to be about two inches in length and nearly the same in width (Fig. 1). He was advised to enter the hospital for operative treatment, to which he consented.

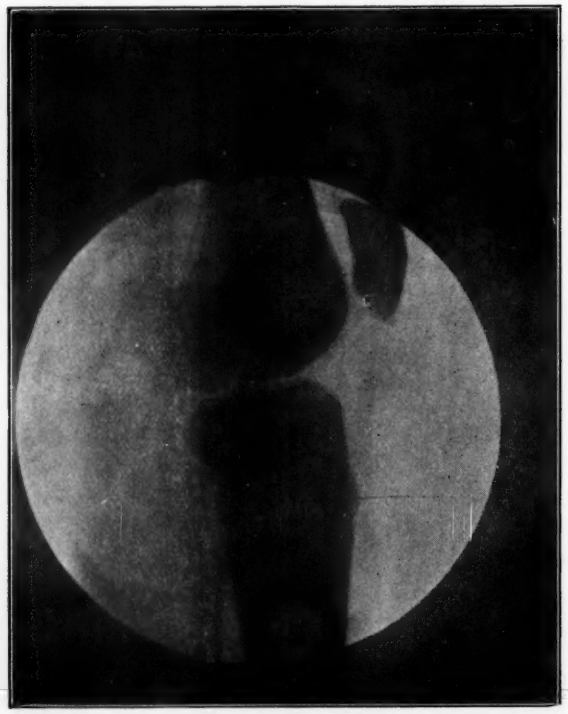

Fig. 2.—Case II. Tuberculous Focus in the Head of the Tibia.

The operation was performed by me on the day following his admission, September 25th, under ether anesthesia. I made a V-shaped incision over the tuberosity of the tibia and after retracting the skin and periosteum, I scooped out with a sharp bone curette about two ounces of softened bone. The place was swabbed with Churchill's tincture of iodin and a gauze drain put in the bottom of the cavity. The wound was sutured, and dressed with gauze and cotton and a posterior gutter splint was applied. Recovery was uninterrupted and the patient was discharged, cured, on November 7th, with the function of the knee unimpaired.

CASE II.—T. B., aged 21 years, was admitted to the hospital on November 19, 1906. He had come to my surgical clinic one week previously, complaining of pain in the head of the left tibia and knee. There was no external evidence of any surgical condition, except slight swelling, and pressure did not localize any sensitive spot. Three months before he had struck his knee against a step, just below the patella. The spot became swollen and quite tender, but did not interfere with walking. All the evidence of injury passed away in a few days, but three weeks previous to his admission to the hospital, the region over the head of the tibia became swollen and quite painful, the pain being more acute at night. Profiting by the experience in the first case, I had Dr. Granger take a skiagraph of the knee, which showed a tuberculous focus in the very center of the head of the tibia (Fig. 2). And it was shown further, that there was no connection between the spot and the outside tissues. In this case also the family and personal history was good, except that the patient had pneumonia three years ago.

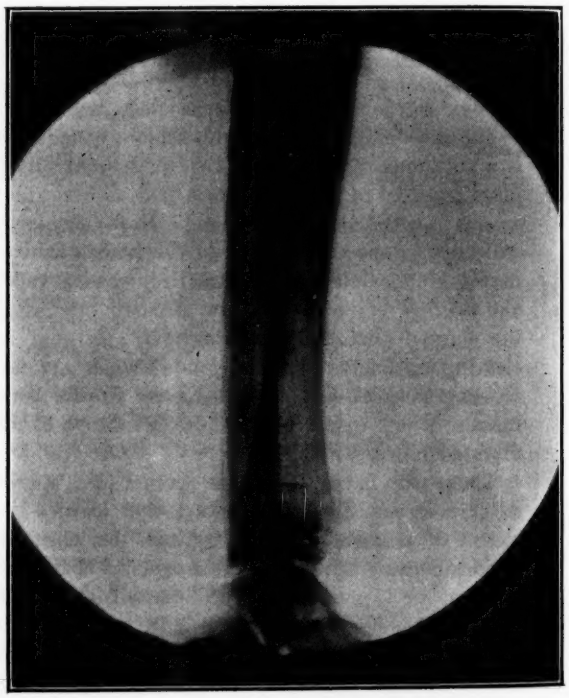

Fig. 3.—Case III. Involvement of the Entire Fibula.

The patient was admitted to the service of Dr. Batchelor, to whom I am indebted for the privilege of reporting this case. A few days after his ad-

mission, Dr. Batchelor operated upon the patient. He made an incision over and extending below the tuberosity of the tibia, under which the diseased area seemed to be. The tissues and periosteum were incised for an inch and a half and retracted, the periosteum being found more adherent than normal. An opening was made into the bone and a well defined cavity, about an inch long and ovoid in shape, was found. The cavity contained a gelatinous, mucoid pus, and it was lined with friable granulations and necrotic bone cancelli. It was removed with a curette and chisel and the cavity saturated with a 10% iodoform emulsion and packed. The wound was closed except a small opening for the removal of the gauze. The result was excellent.

CASE III.—C. B., aged 12 years, a patient of Dr. Leonard C. Chamberlain, to whom I am indebted in reporting this case, had injured his right ankle. Six months later he developed an acute bone lesion about one inch above the ankle on the outer side. This was incised and curetted. One month later, a lesion developed at the ankle and a piece of bone was discharged. Both wounds healed well. Six months after the initial focus, an abscess developed at the middle of the leg on the outer side of the tibia. This abscess was incised, curetted, and drained. It continued to discharge quite freely and it was found that a sinus led down to the middle third of the fibula. It was decided to operate and curette the bone, when, upon being asked to see the case, I suggested that a skiagraph of the leg be taken, which was agreed upon. The skiagraph was taken by Dr. Granger. It showed that the entire fibula from its head to the ankle was involved (Fig. 3). Consequently only the complete removal of the fibula would result in a cure. The folly of curetting the bone just at the point where the sinus had manifested itself was made obvious by the picture. Since the date of taking the skiagraph, the wound has healed and the father of the child refused to have any operative work done.

TUBERCULOSIS OF THE MIDDLE EAR.

The treatment of tuberculous affections of the middle ear is that of the disease in general, and is both prophylactic and active. Our first aim should be to check the progress of the disease and to acquaint the patient with the infectious nature of the aural discharge, that it may be destroyed before it can infect others. Of course the discharge is not nearly as infectious as the sputum, but nevertheless it should be treated in the same way.—ALBERT BARDES in the *Medical Record.*

BLOOD EXAMINATION IN SURGICAL DIAGNOSIS. A PRACTICAL STUDY OF ITS SCOPE AND TECHNIC.

IRA S. WILE, M.D.,
NEW YORK.

(Continued from the October Number.)

MALIGNANT DISEASE.

In malignant disease blood examinations are frequently of differential value. The hematological conditions due to any malignant tumor vary according to the nature, location, extent, duration, rapidity of growth and virulence of the neoplasm. The blood picture is also determined in part by the previous state of health of the patient and his powers of resistance. Generally speaking, any type of anemia may exist, depending largely upon the amount of hemorrhage, and the intensity of the cachexia induced by the toxins arising from the malignant mass. An incipient malignant tumor of small size and slow development produces practically no noticeable effect upon the blood. At most, the hemoglobin is slightly reduced. With progressive development of the pathological processes, the red corpuscles become affected. They become paler and of lessened diameter. They decrease in number, and this decrease may be so extreme as to cause the anemia to assume the pernicious type. This occurs only when cachexia is pronounced. The anemia parallels the degree of cachexia in intensity. The blood index is usually lower than 1.0 but seldom falls as low as the index in severe chlorotic anemia. Frequently, however, the index is greater than 1.0. Normoblasts make their appearance very early in the development of the anemia. Normoblasts are strikingly present when the anemia appears too slight to warrant their presence. When cachexia is merely moderate, megaloblasts appear. The normoblasts outnumber the megaloblasts.

When the cachexia begins to manifest itself, a leucocytosis generally arises. The leucocytosis may be so profound as to allow the leucocyte counts to simulate those of leukemia. In fact, the blood picture may at times present great similarity to that of leukemia. A rapid increase in the number of leucocytes betokens a rapid growth of the neoplasm. Leucocytosis is always opposed to the presence of a benign tumor if hemorrhage and suppuration can be excluded.

The polynuclear neutrophiles are relatively increased as well as absolutely increased. This relative leucocytosis is of great importance when the total leucocyte count is normal or only slightly

above. The lymphocytes are at times relatively increased but usually this is not directly due to the neoplasm. The obstructive effects of the tumor may give rise to faulty nutrition which in turn has its effect upon the leucoblastic tissues.

The specific gravity is lower than normal and parallels the hemoglobin as in health. In malignant disease uncomplicated by hemorrhage or suppuration, the coagulation time is slower than normal. In operations upon cases of malignant disease there is hightened danger from secondary hemorrhage.

CARCINOMA. Slowly progressive carcinomata cause the hemoglobin to be gradually reduced. But it seldom falls below 50%. The hemoglobin is more severely affected by carcinoma involving the viscera than by the peripheral forms of the disease.

The regeneration of the hemoglobin post-operatively gives important information. In cases of carcinoma, the blood is fully a week slower in beginning to regenerate than in cases of hemorrhage. The hemoglobin does not regenerate to the hight existent previous to operation even though the patient may gain in weight. There may be 15% difference between the ante- and post-operative hemoglobin in carcinoma.

Carcinomata may be divided into three classes on the basis of the hemoglobin and red corpuscles:

1. Cases presenting normal blood.

2. Cases presenting reduced hemoglobin, with the number of red corpuscles normal or slightly decreased.

3. Cases presenting low hemoglobin with the number of red corpuscles reduced.

The early case, as desired for operative procedures, usually belongs to the second class. As the disease progresses, the red corpuscles decrease and pronounced anemia ensues. In advanced cases the red corpuscles are reduced but not as low proportionately as the hemoglobin; hence a chlorotic type of anemia develops. As the cachexia becomes profound the red corpuscles may fall sufficiently low to assume the picture of an anemia of the pernicious type. They may be reduced to 1,000,000. Normoblasts, megaloblasts, microcytes, megalocytes, poikilocytes and all types of degenerations appear. Punctate basophilia is especially prominent. The normoblasts predominate over the megaloblasts in the blood picture. The normoblasts appear in all advanced cases of carcinoma even when the red corpuscles are not greatly reduced. This serves to differentiate the anemia of carcinoma from tuberculous and all other anemias, save possibly that arising from sarcoma. In addition to the normoblasts, the most characteristic feature of the anemia of carcinoma is its persistence and resistance to hematinics. About 25% of the cases of carcinoma, particularly when the esophagus or stomach is involved, present a polycythemia. The polycythemia of 6,000,000 to 7,000,000 is due to a concentration of the blood as a result of starvation and loss of the fluids from the body.

The varieties of carcinoma most prone to hemorrhage evidence the most severe anemias. Carcinomata involving the stomach, uterus, and rectum are accompanied early by marked anemia because of the attendant hemorrhage. As a general rule, the more malignant the neoplasm, the greater is the effect upon the blood. The area of tissues covered by carcinomatous cells does not necessarily parallel the malignancy. The blood gives no evidence of the extent of the carcinomatous infiltration.

Leucocytosis occurs in 33% to 50% of all cases of carcinoma. A leucocytosis may be the first indication of cachexia. The nature and degree of leucocytosis varies with the position, size, rapidity of growth and malignancy of the tumor and with the power of resistance on the part of the patient. Carcinoma of the esophagus produces a leucopenia instead of a leucocytosis, when the position of the tumor is such as to obstruct the passage of sufficient food to the stomach. The leucopenia is due to the starvation, however, and is not attributable, save thus indirectly, to the tumor. A relative lymphocytosis accompanies the leucopenia. High leucocytosis may occur in carcinoma of the stomach, uterus, or intestine because of the frequency and severity of hemorrhages rather than on account of the toxic products giving rise to cachexia. Especially high leucocytoses are found when there is involvement of the kidney, pancreas, or thyroid gland. In general terms, the larger the tumor and the more rapid its growth, the higher is the induced leucocytosis. Carcinoma of the omentum or liver presents much higher leucocytosis than tumors of the pylorus or penis. Metastases cause hightened leucocytosis. At times the first expression of metastasis will be a sudden increase of the leucocytes above the hight at which they have been occurring. In consideration of this rise due to metastasis, hemorrhage and suppuration must be excluded.

Carcinoma ventriculi causes an early anemia owing to the almost constant small hemorrhages. The anemia frequently assumes the pernicious type. Leucocytosis is absent in 30% to 40% of the cases. Rapid growth or metastasis causes a rapid increase of the number of leucocytes. The more advanced the condition becomes, the more marked becomes

	Leucocytosis	*Digestive Leucocytosis*	*Normoblasts*	*Hemoglobin*
CARCINOMA	Present	Absent	Common	Decreases gradually Poor regeneration
ULCER	Absent, except after hemorrhage	Present	Rare	Falls suddenly after hemorrhage, but regenerates quickly

	Color Index	*Nucleated Red Corpuscles*	*Leucocytosis*	*Relative Leucocytosis*
MALIGNANT DISEASE	Low (below 1.)	Normoblasts more numerous than megaloblasts	Present in 75% of cases	Polynuclear neutrophilic. Lymphocytosis rarely
PRIMARY PERNICIOUS ANEMIA	High (above 1.)	Megaloblasts more numerous than normoblasts	None or leucopenia	Lymphocytosis

the leucocytosis. Hemorrhage also is a large factor in hightening the leucocyte count. If the leucocytes are as high as 12,000 to 16,000, immediate operation is advisable.

The absence of digestion leucocytosis in carcinoma of the stomach has been given great prominence. The digestive leucocytosis occurs about one hour after meals and lasts from two to four hours. The lack of this leucocytosis is worth investigating in any case of suspected cancer of the stomach. The presence of the digestive leucocytosis does not absolutely exclude carcinoma. In 15% to 20% of the cases of gastric cancer the digestive leucocytosis may persist. Occasionally the digestive leucocytosis is absent in gastric conditions other than carcinoma. It is, however, almost always present in ulcer of the stomach.

Esophageal cancer is more likely to present a leucopenia than a leucocytosis. Relative lymphocytosis is frequently present.

In mammary cancer, operated upon early, the leucocytes fall post-operatively, if all the tissues involved are successfully removed. If the leucocytes fail to fall or fall and rise again within a few months, all infiltrated tissues were not successfully removed or a recurrence is at hand. The leucocytes increase before any other physical sign is present (Hayem).

Cancer of the liver presents leucocytosis in 70% of the cases. Cancer of the intestines, especially of the rectum, shows a moderate leucocytosis, usually accompanied by an eosinophilia.

Renal cancer gives rise to a very high leucocytosis. At times leukemia is suggested by the hight of the leucocyte count. The polynuclear neutrophiles may exhibit only slight relative increase. Cancer of the uterus presents little or no leucocytosis unless hemorrhage has been pronounced or metastasis extensive.

In all the leucocytoses considered, the polynuclear neutrophiles mainly make up the increased number of leucocytes. In 75% of the leucocytoses the polynuclear neutrophiles are relatively increased. Most important is the relative increase of the neutrophilic leucocytes when there is no absolute leucocytosis. The lymphocytosis with leucopenia should be borne in mind when dealing with obstructive conditions of the esophagus. The transitional and large mononuclear leucocytes are often slightly increased. The eosinophiles do not decrease when the leucocytosis develops as is the rule in inflammatory conditions. Their number may be normal or even slightly increased. With bone metastases, the eosinophiles are greatly increased.

Myelocytes appear more frequently in carcinomatous cachexia than in any other condition except leukemia. They are particularly numerous when the anemia is of the pernicious type. The myelocytes vary from 1% to 5%.

The first table may assist in differentiating cancer and ulcer of the stomach.

The second table may aid in differentiating the anemia due to malignant disease from the type of anemia ascribed to primary pernicious anemia (so-called merely because its origin is not yet ascertained).

In obscure conditions a persistent leucocytosis is strongly suggestive of suppuration or malignancy, rather than tuberculosis or syphilis. Leucocytosis excludes hysteria or functional derangement. A lack of leucocytosis does not exclude malignancy.

Sarcoma presents blood pictures quite similar to those of carcinoma. The hemoglobin percentage commonly is lower than in carcinoma. The leucocytosis is higher and more persistent. The relative increase of the polynuclear neutrophiles is less common than in carcinoma. The eosinophiles show higher percentages than in carcinoma, particularly in osteosarcoma.

(To be continued.)

SOME REMARKS CONCERNING GONORRHEA IN THE FEMALE GENITAL TRACT.*

D. W. ROOS, M.D.,
MANISTIQUE, MICH.

Someone has said that "In the beginning God created the heavens, the earth, man and the venereal diseases." This certainly gives our old friend the gonococcus a very ancient, if not a very respectable lineage. While some of the results of his handiwork have been known and watched for centuries, it has remained for the modern bacteriologist and gynecologist to study the individual at close range and to fasten upon him the odium of many crimes of which he has been found guilty.

The commonest site for the gonococcus to take up his abode in the female genitalia is in the cervical endometrium. From there as he multiplies and increases he may migrate to the body of the uterus, on through the Fallopian tubes, exploring the ovaries and planting colonies in the pelvic peritoneum, or he may take a backward movement, infecting the vagina, the vulva, the vulvo-vaginal glands, and more rarely the meatus urinarius. The yellow peril itself cannot be compared to the bold marches and insidious invasions of this tiny organism.

The inflammatory reaction which his presence in the tissues may incite varies according to its intensity and location, from a mild scarcely noticeable endometritis to a virulent salpingitis with involvement of all the pelvic viscera. Abscesses may form in the vaginal glands or the Fallopian tubes. We read quite a little in our journals and text-books about the latency of gonorrhea. The idea is that in a case of moderate severity the virus becomes after a time attenuated through evolution, the tissues become acclimated, so to speak, but with no active inflammatory symptoms this person may be capable of setting up a fresh infection in some luckless individual whose genital organs are exposed, thus offering a fresh field for the growth and development of the disease. This explains why some married women of easy virtue and who are known as a source of contagion among the gilded youth, live in harmony with a husband whose urethra has become immune to the contagion.

Or a young man contracts the disease, is apparently cured, and in a few months marries. Shortly afterward his wife develops an endometritis and the violence of this inflammation may depend conversely upon the attenuation of the virus which has remained so long in a quiescent state in his urethra.

Or we will suppose that a woman whose genital tract containing in some form the germs of the disease, has a natural or a premature birth. As a consequence her organs are in a condition of traumatism. The poison is already there and one can readily see how an autoinfection, either pure or mixed, can take place and be followed by the most serious results.

The treatment of gonorrhea in the female should be directed to the prevention of extension of the process into the higher organs. Rest, both physical and sexual, should be required. Hot vaginal douches containing ten or fifteen grains of potassium permanganate to each quart, the patient being in the recumbent positon, seem especially valuable. This with the daily placing of a cotton-wool tampon saturated with boroglycerid against the cervix and keeping the bowels open is about as active treatment as is desirable during the acute stage. Later, as the cervix becomes more patulous the endometrium may be painted daily with a silver nitrate solution, or iodin. In this proceeding, manipulation should be especially careful to avoid forcing any of the virus farther on into the body of the uterus and perhaps into the tubes. Should vesical irritation arise the internal administration of alkaline diuretics with methylene blue compound or the balsams is indicated. Vulvo-vaginal abscesses should be freely incised and the interior painted with iodin or iodized phenol. The more serious complications of gonorrhea, such as pyosalpinx or other pelvic abscesses, will require laparatomy or vaginal section which should not be attempted by the average physician. It is a grave condition seriously menacing the life of the patient, and she should have every advantage that a modern hospital with trained nurses and skilful operators can give her.

* Read before the Upper Peninsula Medical Society, July, 1907.

EARLY OPERATION IN APPENDICITIS.

In the present state of our knowledge of the pathology of appendicitis and of experience in the technic of its operative relief, it is safe to enunciate the general principle that, in the absence of controlling contraindications, the development of an appendicitis is an indication for removal of the appendix, that such removal is the first indication for treatment, and that all other therapeutic measures, whether hygienic or medicinal, are secondary in importance and to be adopted merely as temporary or preliminary procedures.—LEWIS S. PILCHER in the *Long Island Medical Journal.*

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WALTER M. BRICKNER, M.D., Editor

NEW YORK, NOVEMBER, 1907.

AN EPIDEMIC OF ACUTE ANTERIOR POLIOMYELITIS.

New York City and its vicinity have been visited since last July by an epidemic of anterior poliomyelitis acuta that gives many evidences of continued activity. From the various neurological, pediatric and orthopedic clinics have come reports of many cases, of very varied symptomatology and of all degrees of severity. Indeed this epidemic is furnishing a sadly large amount of material for the collective investigation of a disease rarely seen in its inception and quite obscure in its mode of origin. This statistical study is being undertaken by a joint committee of the New York Neurological Society and the Pediatric Section of the New York Academy of Medicine. There is no doubt that it will add very much to our clinical knowledge of the disease as an acute infectious process.

In fact, individual reports have already demonstrated many interesting clinical features. Some of the cases were mild and of brief duration and terminated in complete recovery. Others bore a striking resemblance to cerebrospinal meningitis: there were marked rigidity of the neck, lasting from a few days to a fortnight; fever for three or four days; occipital headache; photobia; apathy, even coma in some; restlessness, delirium and convulsions in others; Kernig's sign; and gastrointestinal symptoms, such as vomiting and diarrhea or constipation. A still more severe type was manifested by the development of bulbar symptoms, with death in from twenty-four hours to five or six days. The paralytic symptoms varied equally, but not correspondingly. Some cases, with all the early symptoms of a severe process, recovered without any paralysis appearing. In very many the paralysis was very extensive at the beginning, involving all the extremities; but in a fortunately large number of these children it disappeared entirely, or in part, in a few days or a few weeks, and there was complete or partial restoration of all functions. The time of onset of the palsy varied in these reports, from the first to the eighth day.

Even if the study of this epidemic were to develop no other features of the disease than the observation briefly and incompletely referred to above, it can be seen that the classic description of this infantile affection, as found in the text-books, must undergo a revision. Whether some definite information concerning its etiology will also be furnished is less certain.

Thus far, neither laboratory, bedside, nor post-mortem studies have contributed more than negative data to the problem of the cause of anterior poliomyelitis. Examinations of the blood and cerebrospinal fluid have not shown the presence of bacteria, nor have they demonstrated any other noteworthy feature. The recent epidemic of cerebrospinal meningitis, and perhaps also the many cases with meningeal symptoms in this epidemic of poliomyelitis, suggest a possible relationship between the two diseases. The occurrence of a precedent diarrhea was observed sufficiently often to suggest the hypothesis that the bacterial infection is in the intestines, wherefrom are absorbed toxins having a selective action on the nervous system.

While later reports may add much to the known pathological histology of the disease, the epidemic has thus far contributed nothing. There have been noted punctate hemorrhages in the anterior horns of the cord, and areas of softening in the white matter, with involvement of the medulla and the pons.

Concerning treatment, too, the collective study of such a large number of cases may be expected to teach many useful lessons. But until the discovery of the infective agency develops also, perhaps, some antidote or prophylactic, the medical treatment will probably continue to be largely symptomatic. Indeed, except in such instances as have recently been observed in which the paralysis completely or very largely disappeared, anterior poliomyelitis may be classed with the "surgical" diseases. Not only are its essential remedial measures ultimately surgical,

but also is it important, as urged by Lovett in his timely article on another page of this issue, to employ certain simple mechanical means to prevent the development of extreme contractures at that early stage of the disease when, to be sure, the case is still in the hands of the medical man.

SANITARIA FOR SURGICAL TUBERCULOSIS.

Throughout the country the curability of early pulmonary tuberculosis by out-of-door treatment has found recognition in the establishment of numerous public and semi-public sanitaria that have worked remarkable results in the restoration of thousands to health and activity.

That the same general management is of inestimable benefit to those also numerous, equally distressing and often crippling cases, grouped under the title of "surgical tuberculosis," is, unfortunately, not as generally recognized. At any rate, in this country there are but few sanitaria for the open-air treatment of these cases. Such institutions as the N. Y. State Hospital for Crippled Children are beneficent, but their scope is narrow. The Sea Breeze Hospital at Coney Island, limiting itself also to children, has, nevertheless, accomplished such splendid results that it stands as an example of what ought to be done, and, in fact, has served as one of the most potent arguments for the establishment of other fresh-air institutions.

Indeed, the successful work of the Sea Breeze Hospital has stimulated the City of New York to set aside 1,000 feet at Rockaway Beach for a similar but much larger hospital; and the Association for Improving the Condition of the Poor has raised $250,000 for the buildings, plans for which have already been submitted. New York City, the first municipality in America to establish a country sanitarium for consumptives, and the most active city in the municipal control of the disease, will thus also be the first to establish a seaside hospital for the treatment of bone and joint tuberculosis in children.

This is a good start, indeed, but only a start. Sanitaria for adults also are sadly needed. Patients with tuberculosis of tissues other than the lungs and the skeletal system (*e. g.*, of the lymphatic glands, the skin, the eye, the breast, the ear), must also be admitted to them. Until we find a specific for tuberculosis, local surgical measures—conservative, and, sometimes, radical—will also be needed for these patients; and such sanitaria will no doubt have to be equipped with ample surgical facilities, unless, indeed, they are associated with general hospitals wherefrom the patients can be promptly transferred. It needs no argument that the treatment of, for example, bone and gland tuberculosis, in city hospitals alone, is sadly inadequate. While local cures are often obtained—usually after prolonged hospital residence—even this often fails, and in many cases there is nothing accomplished to fortify the patient against recurrence of the disease in the same or some other part of the body. Also apparent is the utter hopelessness, in many cases at least, of the out-patient treatment of children and adults who are improperly fed and badly housed.

At this time, when public funds and so many private fortunes have been devoted to hospitals for acute diseases, cancer, pulmonary tuberculosis, cripples, incurables, etc., etc., one might urgently pray that the next large hospital appropriation or bequest will mark the establishment of a country sanitarium for cases of all varieties of "surgical tuberculosis" where patients can enjoy rational hygienic treatment in connection with conservative local measures, or whereto they can be promptly transferred after more active local treatment at home.

HOSPITALS AS UNDERGRADUATE SCHOOLS OF MEDICINE.

Every hospital is a school of medicine to its resident and attending staff and, indirectly, to the medical profession at large. But the hospitals in the cities of medical colleges have a larger responsibility; nor will they do their full duty to the community that supports them until they open their wards to the future generation of practitioners—the undergraduate students.

That medicine is too vast, too complex, to be taught by four years of didactics, "clinics" and limited out-patient observations needs no argument. That ward patients do not object to, and are benefited rather than hurt by, the presence of a student-body, there is ample evidence from hospitals where teaching is done. Surely, if patients object little or not at all to examination at hospital clinics, they will find no hardship in the presence, as junior members of the resident staff, of last-year medical students orderly conducting the minor duties of ward routine.

If young men are to be equipped with that familiarity with sickness and sick people which their diplomas are supposed to represent, they must spend at least several months as assistants in the wards and operating rooms of a hospital. The governors of our hospitals need but to be enlightened. The faculties and trustees of our colleges need to be aroused!

Surgical Suggestions.

Bleeding after coitus is sometimes the earliest sign of cancer of the cervix.

An obstinate constipation may be due to an extreme retroflexion of the uterus, the organ lying in the hollow of the sacrum.

Hypernephroma is distinguished from the other malignant tumors of the kidney by the very early appearance of hematuria.

A retropharyngeal or peritonsillar swelling that is very edematous will often disappear under the administration of large doses of aspirin.

A small, hard, tender nodule situated over the thenar or hypothenar eminences may be a broken-down dermoid cyst.

Pain is often present for months after a fracture of the leg, especially in elderly people. This is mainly due to the formation of the callus and needs no operative interference. Of course, a subacute osteomyelitis must be kept in mind.

Involution growths in the breast are very often cystic, even though the mass appears to the feel to be solid throughout. Carcinomatous degeneration is sometimes found in the cyst wall of these originally benign growths.

The triad of symptoms—pain, vomiting and distention—without fever, points to intestinal obstruction.

The presence of a tumor of the sigmoid flexure with symptoms of chronic obstruction does not always indicate a cancer. Such a condition may be due to a "diverticulitis."

When a patient gives all the signs and symptoms of appendicitis, if the stools have been noticeably black, a duodenal ulcer should be kept in mind.

A boggy, tender abdomen is often suggestive of a pneumococcus peritonitis. A careful inquiry as to a previous pneumonia or empyema is most important.

The presence of an indefinite mass in the abdomen of a child running intermittent temperatures may mean a tuberculous peritonitis.

Too frequent enemata before operation may be productive of a great deal of post-operative distention.

Post-operative acute intestinal obstruction in rare instances has for its causation an interstitial hernia through the abdominal wall. A mass composed of confined gut is usually present.

In cases of strangulated hernia a simple enterostomy after cutting the neck of the sac will often save a life where a prolonged operation would result in death.

The only evidence of an acute intussusception may be the passage of a small amount of blood per rectum. One should always make a thorough rectal examination as even an intussusception high up in the small intestine may sometimes be felt per rectum.

Before deciding on the necessity for a laparotomy for some vague abdominal condition, where distention is present, empty the bladder. In many cases the acute abdominal distress will disappear.

Moderate bloody discharge after extirpation of the gall-bladder, is most often due to oozing from the raw surface of the liver. Sudden, profuse, bloody discharge is more dangerous as it means that the ligature has slipped from the cystic artery.

An ovarian cyst with a long pedicle may be found in any part of the abdominal cavity. They rarely give pain unless the pedicle becomes twisted. In such a case, a differential diagnosis between it and a hydronephrosis is very difficult. One may suspect the true condition by the movability of the tumor.

A mesenteric cyst may give the same signs as a small ovarian cyst. Mesenteric cysts, although movable, are usually attached to the ascending colon. When the colon is dilated a direct relation can be made out between the gut and the tumor.

The distressing thirst after abdominal operations, where fluid by mouth produces vomiting, is best relieved by subcutaneous infusions of normal salt solutions; or by the insertion of a tube into the rectum connected with a bag of saline solution placed just above the level of the patient's hips, allowing the injection of water drop by drop and so slowly that no irritation of the rectum is set up. The patient may in this manner receive small quantities of water for hours.

Book Reviews.

Human Anatomy, Including Structure and Development and Practical Considerations. By THOMAS DWIGHT, M.D., LL.D., Parkman Professor of Anatomy in Harvard University; CARL A. HAMANN, M.D., Professor of Anatomy in Western Reserve University; J. PLAYFAIR MCMURRICH, Ph.D., Professor of Anatomy in the University of Michigan; GEORGE A. PIERSOL, M.D., Sc.D., Professor of Anatomy in the University of Pennsylvania; and J. WILLIAM WHITE, M.D., Ph.D., LL.D., John Rhea Barton Professor of Surgery in the University of Pennsylvania. With 1,734 illustrations, of which 1,522 are original and largely from dissections by JOHN C. HEISLER, M.D., Professor of Anatomy in the Medico-Chirurgical College. Edited by GEORGE A. PIERSOL. Large octavo; 2,088 pages. Philadelphia and London: J. B. LIPPINCOTT CO., 1907.

The title of the book sufficiently explains its scope. Besides being a complete descriptive anatomy, the sections dealing with "practical considerations" bring before the reader such surgical or medical matters as have a direct bearing on the anatomical parts discussed. This part of the work is full and yet concise, and is so well selected that it will bear favorable comparison with many of the special treatises on surgical anatomy. The anatomical sections, which comprise the major part of this text-book, are clearly written, well planned and up to date. Variations are fully considered, original sources quoted, and yet no attempt at too full discussion of still doubtful questions is indulged in. The common English terms are employed, but the B. N. A. synonyms are given in special type. Embryology is very thoroughly discussed, and the histology of the body cannot be found more fully or clearly detailed in the most modern special text-books. Of course, as in all anatomies the success of the book hinges upon the illustrations, and special efforts appear to have been made to excel in this department. All of the illustrations are true to nature and almost all are clear cut and instructive. Many beautiful dissections, especially of regions not usually well illustrated, will be found, also valuable drawings of fractures, etc. The muscles of the body are especially well shown. The small drawings, showing the muscular attachments to the long bones, are, however, not satisfying. The same thing may be said of the dissections of the peripheral nervous system, where, although the drawings are beyond reproach, the nerves should have been "brought out" in color so as to afford more contrast. The illustrations accompanying the description of the stomach and intestine also lack the qualities which impress the subject upon the mind of the student.

The work represents a very successful effort to give a modern exposition of human anatomy and of its associated branches—histology, embryology and surgical anatomy. It will prove of equal value as a text-book and as a reference handbook. Although a collaborative effort, no unevenness or gaps are apparent.

A Practical Treatise on Fractures and Dislocations. By LEWIS A. STIMSON, A.B., M.D., LL.D., Professor of Surgery in Cornell University Medical College, New York; Surgeon to the New York and Hudson Street Hospitals; Consulting Surgeon to Bellevue, Christ's and St. John's Hospitals, etc. *Fifth Edition,* revised and enlarged. Large octavo; 854 pages; 352 illustrations and 52 plates in monotint. New York and Philadelphia: LEA BROTHERS & CO., 1907.

Two years ago we reviewed at considerable length the fourth edition of this well-known work. After a study of this edition we find no reason to withdraw any of the praise uttered upon the appearance of the preceding one. In actual bulk the volume has been increased by but ten pages, but space for new text and new illustrations has also been made by the omission of some case histories.

Among the sections revised are those, notably, on fracture of the head and neck of the radius, on fracture of the carpal scaphoid and on dislocation of the semilunar and on fractures of the tarsal and metatarsal bones. Two new, brief sections have been introduced on fracture of the tarsal scaphoid and cuboid, respectively. References to all the important literature of the past two years have been incorporated. Indeed, in bibliographical references this work is remarkably complete.

While methods of treatment are carefully laid down, one regrets that the author does not also give his readers the benefit of those details and "wrinkles" in the actual application of splints and dressings which his abundant experience must have acquired. It is in these very details, carefully described and pictorially demonstrated, that Scudder's work is so attractive. He who supplements Stimson's classic with that very practical manual will possess a library on fractures and dislocations to which little can be added to-day.

Nouveau Traité de Chirurgie. Publié sous la direction de A. LE DENTU et PIERRE DELBET.. Fascicule IX. *Muscles, Aponéuroses, Tendons, Tissus péritendineux, Bourses séreuses.* Par LOUIS OMBRÉDANNE, Chirurgien des Hopitaux de Paris. Octavo; 198 pages; 45 illustrations. Paris: J. B. BAILLIÈRE ET FILS, 1907.

The parts of the second edition of the treatise do not appear in any regular sequence and the present part IX is the second to be published. The contents are sufficiently indicated by the title. The importance of tuberculous infections is emphasized by the space devoted to them. Tuberculous tenosynovitis, according to Ombrédanne, should be radically treated only in otherwise healthy adults, in whom a complete extirpation can be performed; while tuberculous bursitis should always receive radical removal and special attention should be directed toward an underlying and possibly concealed bone focus. The exposition is clear and complete. Special surgery of the parts is not touched upon.

Treatment of the Diseases of Children. By CHARLES GILMORE KERLEY, M.D., Professor of Diseases of Children, New York Polyclinic Medical School and Hospital; Attending Physician to the New York Infant Asylum; Attending Physician for Children, Sydenham Hospital, New York; Assistant Attending Physician to The Babies' Hospital, New York; President of the American Pediatric Society, etc. Octavo; 597 pages; illustrated. Philadelphia and London: W. B. SAUNDERS COMPANY, 1907.

The author signifies his purpose in bringing forth this book, by saying in its preface that it "was not written with a view to supplying the needs of either the specialist in children's diseases or the undergraduate student." He has attempted to elucidate the rational methods of treatment by following a more or less thorough exposition of symptoms with an elaboration of the treatment in specific terms. Thus he does not merely indicate, as most books on treatment do, the general lines of therapeutic procedure. The quotations of illustrative cases which have come within the author's experience, adds much to the clinical and personal value of the work.

The book is divided into twenty-five chapters, the first five and the longest of which are devoted to the *general care of the patient* and to *disorders of nutrition.* The remaining chapters, however, show little effort at systematic arrangement. For example, the chapters on *the urine* and *the male and female genital tract* are interposed between the chapters on *contagious diseases* and *nervous disorders.* The last five chapters are devoted to isolated subjects—*vaccination, instructions for the summer, therapeutic measures, gymnastic therapeutics, drugs and drug dosages.* Each one of these forms an excellent monograph, and the one on *gymnastic therapeutics,* excellently illustrated, is a valuable contribution to a subject which is generally sparsely dealt with.

Very few cases are illustrated and these but poorly. The table of drug dosages at the end of the volume is to be condemned on general principles as it is apt to be followed without consideration. The general text is excellent and very readable.

The book is more entertaining than scientific, but being written clearly, it fills a very useful place in medical literature, as it meets the needs of that class of practitioners who wish a ready reference book on treatment. Such books should be written, as this one is, by men who are known and whose opinions can be trusted.

Progress in Surgery.

A Résumé of Recent Literature.

Hemorrhage and Transfusion. GEORGE CRILE, Cleveland. *Wisconsin Medical Journal,* September, 1907.

In this paper, Crile reports further instances of the results of transfusion of blood in cases of hemorrhage. In his earlier series, Crile employed the end-to-end anastomosis with the method devised by Carrel for the suture of bloodvessels. At present, he uses a metal tube through which one vessel is drawn, folded over the back and tied; the other vessel is then drawn over the turned-back cuff and also tied. In this way he obtains a canal lined by endothelial covering. The vessels anastomosed are the proximal end of the radial artery of the donor and any superficial vein on the arm of the donee. Cocain anesthesia is employed. The amount of blood to be transfused must be carefully gauged. This depends on the appearance of the donor, as well as of the donee, the length of time of the transfusion and the experience of the operator. The chief question to be considered is that of causing acute dilatation of the heart. On the appearance of this complication, the infusion is to be stopped at once until the symptoms subside. The infusion is then again allowed to proceed, more slowly. Crile reports seven interesting cases in which life appears to have been saved by this procedure. He also reports another case of repeated uterine, nasal and subcutaneous hemorrhages due to deep jaundice, in which transfusion was performed with the effect that the bleedings promptly ceased. The author presumes that the infusion increases the coagulability of the blood.

The Technic of Direct Transfusion of Blood. G. CRILE, Cleveland. *Annals of Surgery,* September, 1907.

The paper is based on 225 animal experiments and 32 clinical cases. The radical artery of the donor is anastomosed to the proximal end of any vein of the arm of the recipient. All danger of clothing is obviated by using a modified Paye button, to be described below, and thus obviating even the slight danger following the use of Carrel's suture. The donor is placed on an operating table with a Trendelenburg attachment (in case of fainting) and about 3 cm. of his radial artery exposed, a Crile clamp

Canula for Direct Transfusion of Blood (enlarged).

placed proximally, the distal end ligated and the artery cut across. The adventitia is pulled over the free end and closely snipped off. Three to 4 cm. of a superficial vein of the recipient is similarly prepared. A canula the bore of which is larger than the outside caliber of either vessel is selected, the vein is pushed through the tube, after which the free end is turned back like a cuff and snugly tied in the second groove. The handle on the canula permits of its being steadied by a forceps. If the artery is contracted it may be dilated by pushing a mosquito hemostat into its lumen and gradually opening it. The artery is then pulled over the vein and tied by a linen thread in the first groove. The clamp is now removed from the vein and then gradually from the artery. Excessive vasocontraction is overcome by keeping the field covered with warm saline solution. The amount of blood should be gauged so as not to overload the pulmonary circulation.

Arterio-Venous Anastomosis—Its Application to Surgery. GASTON SARRANCE, Birmingham. *Virginia Medical Semi-Monthly,* September 13, 1907.

The author reports the following case: A man had both legs crushed by some falling iron. There was a simple fracture of the left leg and a compound fracture of the right ankle. The bones of the ankle and lower end of the leg "resembled ice broken in a towel." The anterior tibial artery was severed and the tissues were so badly lacerated that it was a question whether the posterior tibial artery was intact. The author attempted to save the foot by restoring the circulation, and so he united, with Carrel sutures, the anterior tibial artery to the internal saphenous vein, which had also been severed. The following day the foot was warm and natural in appearance. The artery could be seen for a short distance, and although no pulsation could be noted, the author believes that some blood was flowing through. On the eleventh day a clot began to form within the vessel and the latter soon showed signs of sloughing. The author believes that the artery supplied blood to the foot for at least two weeks until a collateral circulation was established. Unfortunately, four months later, the patient insisted upon amputation; this was done while the author was away, and nothing was found out as to how the circulation was being carried on.

Eserin Salicylate as a Prophylactic Against Atony of the Bowels. H. N. VINEBERG, New York. *Surgery, Gynecology and Obstetrics,* August, 1907.

Postoperative distension is not so much the result of absence of thorough preparation, but is more often due to prolonged narcosis, handling of the intestine, slips in asepsis, etc. In badly adherent pyosalpinx trouble is less apt to occur when the right side is involved, as on the left the sigmoid and its mesocolon are more frequently injured, while on the right the bowel is not in as intimate relationship. Paralytic and post-operative ileus are the diseases especially referred to in this paper. The lesions resulting from prolonged anesthesia are small hemorrhages and air bubbles in the intestinal wall accompanied by the penetration of bacteria.

In thirty-seven cases eserin was given with the initial dose of morphin immediately after operation. In fifty-five cases the drug was not administered. On the whole the first group required enemata less early or not at all. Nevertheless some cases seemed unaffected by the drug. It may be said, that while a more extended trial is necessary, before giving an ultimate opinion, the drug is perfectly harmless and doubtless effective in many instances.

The Use of Carbon Dioxid Snow in the Treatment of Nevi and Other Lesions of the Skin. Preliminary Report. WM. ALLEN PUSEY, Chicago. *Journal of the American Medical Association,* October 19, 1907.

This preliminary report calls attention to the use of frozen carbon dioxid for the destruction of lesions of the skin or for producing a violent inflammatory reaction in such lesions. Pusey reports two cases of extensive hairy nevus, one of them illustrated, treated by this method with striking results, and one of erythematous lupus apparently completely cured. He has also successfully treated several cases of vascular nevus by this method. In cavernous nevi he believes it would succeed only in selected cases. In lupus vulgaris it is ineffective, and the same is perhaps true of epithelioma. This method furnishes a convenient and effective treatment of warts, calluses, senile keratoses and other such lesions. Carbon dioxid in the liquid form can be obtained in the drums in which it is sold to druggists, and as it escapes from the cylinder it is collected on cloth or chamois skin in the form of a fine snow. This can be compressed and cut with a knife into any shape desired. Its effects depend on the pressure with which it is applied and the duration of the application. By regulating these its destructive action is controllable and can be accurately gauged. With strong pressure, freezing to a depth of from one-eighth to one-sixth of an inch can be produced in a few seconds. As a rule, Pusey employs just enough pressure to hold the snow firmly against the skin, but varies this sometimes according to the effect desired. Applications of from five to ten seconds are sufficient to remove thin layers of pigment from the skin or when an inflammatory reaction is desired for therapeutic purposes, as in erythematous lupus. In practice, Pusey finds applications of from ten to thirty seconds most satisfactory; they can

be gauged accurately and there is almost no scarring. With longer applications there is a slight amount of white scar, due to destruction of the capillaries. If prompt action is desired and moderate scarring makes no difference, a vigorous prolonged single application can be made and the work done at once. If deep destructive action is wanted the application can be repeated on successive days or at longer intervals. Otherwise the application of the snow should not be repeated until the effect of the previous application has disappeared.

The depth and perhaps the suddenness of the freezing with carbon dioxid constitute the difference between it and freezing volatile mixtures simply sprayed on the surface. As compared with the employment of liquid air the latter has these objections: It is not obtainable commercially. It cannot be confined in a closed vessel but must be allowed to evaporate slowly, so that a supply lasts but a short time even though not used. Liquid air freezes at — 180° C, carbon dioxid at — 90° C. The former is therefore twice as cold as carbon dioxid snow, but this Pusey thinks is not an advantage, and may be a disadvantage.

Femoral Hernia: A New Operation for the Radical Cure. A. V. MOSCHCOWITZ, New York. *New York State Journal of Medicine,* October, 1907.

The two cardinal principles to be followed in the operative cure of hernia, according to the author, are: (1) Flush closure of the peritoneal sac. (2) The placing of a firm and permanent barrier of tissue in front of the peritoneum. The author finds technical and theoretical violations of these principles in nearly all the methods that have thus far been devised for the operative cure of femoral hernia. In order to carry out these principles fully, Moschcowitz has devised the following simple operation: The incision is made in the inguinal region just as for inguinal hernia. The aponeurosis of the external oblique is divided, and when Poupart's ligament and the conjoined tendon are retracted the neck of the femoral sac is exposed. The sac is opened and the contents are reduced. With a dressing forceps inserted to the bottom of the sac, the latter is inverted and drawn out of the wound. The femoral hernia has now been converted into a direct inguinal hernia. The sac is tied off flush with the peritoneum. In order to completely close the femoral ring three or four chromic gut sutures are passed between Poupart's ligament on one side and Cooper's ligament (a continuation of the pectineal fascia) on the other. The possibility of an inguinal hernia is then obviated by suturing the conjoined tendon to Poupart's ligament; the superficial fascia and skin are then sutured and the operation is completed. The operation is simple, takes very little time and fulfils all the indications required. The author has operated upon 29 cases, all of which have been thus far free from recurrence.

Rectal Anesthesia. J. H. CUNNINGHAM, Boston. *Boston Medical and Surgical Journal,* September 12, 1907.

This method of producing anesthesia was suggested many years ago but was soon abandoned owing to the diarrhea and melena that resulted, and also because of the difficulty of controlling the anesthetic. The author has studied the subject and has evolved a method and a special apparatus whereby both these disadvantages are obviated.

The bowels are first thoroughly cleaned out. The patient is placed upon his back with the legs in slight flexion. Ether is then pumped into the rectum until there is considerable pressure of gas around the rectal tube; the finger is then inserted into the rectum and the normal gases of the rectum are allowed to escape. If this is not done the ether is absorbed much more slowly. After the gas is expelled the bulb is squeezed every five to ten seconds until it is expelled around the tube. The narcosis is complete in a very short time and without any stage of excitement. After the patient is once under, the narcosis is easily kept up by squeezing the bulb about five times a minute. The same signs should be watched for as in inhalation narcosis. The advantages of the method are: (1) Very little ether is used. (2) There is no stage of excitement. (3) Vomiting is infrequent. (4) Rapid ether recovery. The bowels are inclined to be constipated. In his own series the author has had two deaths, but in both the anesthetic was probably not the cause. The method is successful in every case, except where the rectum is not completely emptied. Owing to distension, this method is not applicable to abdominal cases. For details the reader is referred to the original highly suggestive and instructive paper.

Rectal Anesthesia. Experimental Studies, Together with a Report of Its Practical Employment at Roosevelt Hospital. N. B. LEGGETT, New York. *Annals of Surgery,* October, 1907.

A modified Cunningham apparatus was used. The ether is warmed but kept below its boiling point (37° C.) so that no condensation ensues. By means of a Y tube the rectum can be emptied of gases, if a feeling of distension arises, and a U glass tube enables the anesthetist to see that no fluid ether is introduced. The vapor is forced in by means of a rubber hand bulb. Thirty-one patients were anesthetized. In two cases the method proved unsuccessful, in one of these because the rectum had been inadequately prepared.

Rectal anesthesia is not followed by pulmonary and bronchial irritation. In operations about the head and neck the anesthetist does not interfere with the operator. In only one case did rectal irritation (a small hemorrhage) follow. The time necessary to produce complete narcosis is considerably prolonged.

The Treatment of Pseudoarthrosis and Retarded Callus Formation by Injection of Blood. VICTOR SCHMIEDEN, Bonn. *Journal of the American Medical Association,* August 3, 1907.

Bier's method of treating pseudarthrosis and retarded callus formation by injections of human venous blood between the separated fragments of bone is based on the theory that the formation of callus in fractures is due to the inflammatory reaction caused by the hemorrhage attending the fracture, and this inflammatory reaction failing, we can re-excite it by making, so to speak, an artificial hemorrhage. In Bier's clinic, the technic is as follows: The site of the "false joint," as well as the arm from which the blood is taken, are rendered aseptic. By the use of a light constricting band the veins are made prominent and then one of the largest vessels is punctured or incised and 30 or 40 c.c. of blood are drawn into the syringe. The syringe must be large and its needle sufficiently strong that the blood can be readily forced through it. It must be strong also because much force is needed to inject into the hard scar tissue. The blood must be forced, not only between the fractured ends, but also around them in places where, from periosteal and paraosteal tissue, callus may be formed. It is important also that the blood be injected immediately after its removal, using the same syringe into which it has been drawn, as it tends to prevent coagulation in the syringe. Blood containing fibrin gives better results than defibrinated blood. From 20 to 40 c.c., according to the size of the bones, is injected, the operation being repeated every ten days. In most cases there is a visible reaction and after its subsidence a tumor remains that becomes callus. Sometimes one or two injections suffice, in other cases five or six may be needed. The more recent the fracture the greater the chances of success, hence the best results are obtained in cases of retarded callus formation. In some old cases of pseudarthrosis the method fails, but the same is true of all other methods. In a large number of cases treated in this way he has never seen any harmful effects. He has often injected blood taken from another healthy subject and has found it more effective.

A Study of Seven Hundred and Fifty Fractures of Long Bones of the Lower Extremity, with Special Reference to the Cause of Delayed Union. L. G. PAUL, Boston. *Boston Medical and Surgical Journal,* August 22, 1907.

Only simple fractures of the shafts of the bones were considered in this study. Fractures through the neck or condyles of the femur and through the heads or malleoli of the tibia and fibula were not included. No compound

fractures were considered. The author's study consists of a mass of statistics from which the following conclusions were arrived at:

(1) In fractures of the long bones of the leg the proportion of males to females is about 4 to 1.

(2) Fractures of the right leg are only slightly more frequent than of the left.

(3) Fractures of the femur are proportionately more frequent in children than in adults.

(4) High fractures in any of these three bones are rare in children under ten years of age, but are found in adults past middle age.

(5) Fractures in children unite readily, and old age of itself is not a cause of delayed union.

(6) The majority of fractures in which union is delayed are of the oblique or comminuted variety.

(7) In the great majority of cases, delay in union is due to local causes, such as interposition of muscular tissue beteen the fragments, or faulty approximation of fragments.

(8) Constitutional diseases rarely cause delay in union, but certain fractures, for some unknown reason, fail to unite, although the approximation is accurate and no constitutional disease is present.

A New Method of Extension in the Treatment of Fractures (*Eine neue Extensionsmethode in der Frakturenbehandlung*). F. STEINMANN. *Zentralblatt für Chirurgie*, August 10, 1907.

This method was elaborated to overcome the defects inherent in extension by means of adhesive plaster, which may produce eczema, decubitus and gangrene. Two sharp nails (nickel plated steel nails) are hammered into the most superficial bony parts of the lower fragment, as for instance the condyles in a case of fracture of the femur. To these nails are attached wires and the weight used for producing the traction. Of course asepsis is needed, but the minute puncture requires only to be guarded by a collodion dressing. Usually it is advisable to give light narcosis during the setting and hammering, but subsequently the method is painless. The entire limb is unhampered by dressings and early massage and movement is not interfered with. The removal of the nails is facilitated by the fact that they become loose; it is therefore advisable to introduce them at a slant to prevent accidental loosening. Unless all anatomical relations are ignored no vital or important structures can be endangered, and in practice the method has given good results.

Extrusion of an Artery Forceps Into the Bladder (*Einwanderung einer bei einer Laparotomie vergessenen Arterienklemme in die Blase*). W. STOECKEL, Berlin. *Zentralblatt für Gynäkologie*, September 14, 1907.

The patient had been laparotomized eight months previously for intestinal obstruction after a complicated labor. The sudden onset of severe dysuria and cloudy urine caused her to seek relief. Vaginal examination showed the presence of an elongated, hard foreign body in front of the uterus but below the symphysis. Cystoscopy disclosed the tip of a metallic instrument projecting into the bladder, through an opening which was surrounded by a marked area of bulbous edema. Pus escaped from the same opening, which evidently communicated with the extravesical abscess cavity, determined by bimanual examination. X-ray examination proved the instrument to be an artery forceps. Suprapubic operation appeared too dangerous to undertake; therefore the bladder was opened by means of a vaginal incision and the forceps readily extracted. The subsequent course was uneventful except for a small vesicovaginal fistula which is contracting at the time of report.

Inflammatory Exudate About a Foreign Body Operated Upon for Tumor (*Entzündung um Fremdkörper als Tumor operiert*). J. RICHTER, Vienna. *Wiener Klinische Wochenschrift*, July 18, 1907.

The following two cases were reported to show how readily inflammatory reaction about a foreign body may simulate a tumor. The first patient had a left inguinal hernia which was relieved for six years by a truss. One year ago pain developed in the inguinal region. A slowly growing tumor was noted above the spot where the truss pad was applied. This tumor apparently was in the abdominal wall. At operation a tumor the size of a man's fist was encountered above the hernial sac and involving all the layers of muscle. As the mass seemed malignant, it was widely excised, sacrificing part of Poupart's ligament, peritoneum and muscles. The big defect was closed by a plastic operation for which the abdominal muscles and a flap from the sartorius muscle were employed. The tumor was composed of fibrous tissue in which was imbedded three pieces of partly oxidized iron wire each 2 cm. long. The wire had probably been expelled from the intestine by perforation of its wall.

Case two is that of a female patient who for more than a year had suffered from a severe cystitis. Bladder irrigation ameliorated the inflammation. Cystoscopy showed a projecting papillary tumor at the fundus of the bladder. Supropubic section demonstrated that the site of the tumor was adherent to the intraperitoneal viscera. The peritoneum was therefore opened and adherent omentum resected, while a loop of gut adherent to the omentum was liberated. The peritoneum was now closed by suturing it lower down to the posterior bladder wall. The bladder was opened extra-peritoneally, the tumor extirpated and the bladder wound closed. The abdominal wound was closed with drainage down to the bladder. Recovery proved uneventful. The tumor, which appeared infiltrative in character, was larger than a walnut and had omentum adherent to its posterior peritoneal aspect. It was composed of fibrous tissue containing in its center a thin, 2 cm. long, sliver of wood. The origin of the tumor was here again inflammatory, and the splinter had evidently wandered into the bladder from the intestine.

Abortion Induced by Means of the X-Ray (*Ein Abort durch Röntgenstrahlen*). M. FRAENKEL. *Zentralblatt für Gynäkologie*, August 3, 1907.

The patient was a young woman suffering from tuberculosis and three months pregnant, induction of abortion being demanded by the attending and consulting physicians. The patient was subjected to twenty-five X-ray exposures, the ovaries and the thyroid gland being exposed for five to ten minutes on successive days. Adjoining regions were carefully protected. The abortion was ushered in by cramps and occurred accompanied by hemorrhage, which ceased as soon as the products of conception were expelled.

Exposure of the thyroid to the ray, in three other patients (for goitre) produced irregularity of the menstrual function, which irregularity lasted for several months after the treatment was stopped.

Each ovarian exposure is followed by uterine contractions manifesting themselves as cramps, also by vesical spasm. A similar phenomenon is noted in experiments on animals.

Posture of Appendicitis Patients (*Die Lagerung des Kranken bei der Appendicitis*). H. DREESMANN, Cologne. *Medizinische Klinik*, September 8, 1907.

The author believes that the rapid spread of the serous or seropurulent exudate in appendicitis is largely due to the posture. He has consequently employed posture to overcome this danger. Patients are placed on their right side, with bent knees, the left knee being slightly in front of the right, and, if necessary, separated from it by a cushion. This position is comfortable and permits of defecation and urination without turning. Fluid of any kind naturally gravitates into the right iliac fossa and lumbar region. Dreesmann claims that pelvic and left-sided abscesses are thus avoided and encapsulation is encouraged. The position should be assumed before, as well as after operation, and especially during removal to the hospital.

Appendicitis Simulating Sacro-Iliac Disease and Sciatica. J. TORRANCE RUGH, Philadelphia. *Therapeutic Gazette*, October 5, 1907.

Pugh reports two cases: in one case the primary symptoms complained of were those of sacro-iliac disease; in the second, the symptoms were those of sacro-iliac disease and sciatica. Measures directed against these disorders

proved of no avail; on more careful examination, however, symptoms and signs of a chronic appendicitis were brought to light and after removal of the appendix all symptoms disappeared.

A Contribution to the Pathology of the So-called "Essential Hematuria." H. L. KRETCHMER, Chicago. *Chicago Medical Recorder*, October, 1907.

Kretchmer reports an interesting case of hematuria. The bleeding was found to come from the left ureter; the kidney was exposed, but nothing grossly abnormal was noted; the capsule was stripped but with only a temporary benefit; six months later the kidney required removal owing to slow exsanguination. The author studied the kidney very minutely and found a hyaline degeneration of the capillary wall of the glomeruli and a proliferation of the endothelial cells which in a later stage resulted in obliteration of the Malpighian body. As a result of the study of this case and of the literature, the author arrives at the following conclusions:

1. The supposition that a hematuria originates from a kidney without anatomical changes is not permissible if the following conditions are not fulfilled. In the first place it must be absolutely proven that the hemorrhage does not come from some other part of the urinary tract except the kidney, by means of cystoscopy and ureteral catheterization, and secondly, microscopic examinations of the supposedly anatomically normal kidney must have been made.

2. Profuse bleeding from the kidney may be the consequence of very slight changes, microscopically, in the kidney. The present status of the microscopic findings do not permit us to draw any conclusions from the grade of changes present, relative to the severity of the hemorrhage, or to infer with certainty the tendency of such a kidney to bleed. Therefore it is impossible to declare such changes, as being too insignificant to explain the tendency to bleeding.

3. In some cases of "essential hematuria" decapsulation as well as nephrotomy proves itself a definite curative agent.

In other cases, and also in such cases which, like the one reported, show only apparently insignificant changes microscopically, the result is not a permanent one and the necessity for a nephrectomy may present itself at a somewhat later period.

4. The clinical symptoms of renal hematuria, correspond to various anatomical and microscopical changes in the kidneys, in the individual cases.

Hematuria Due to Small Doses of Urotropin. J. G. BEARDSLEY, Philadelphia. *Pennsylvania Medical Journal*, June, 1907.

Beardsley reports three cases in which hematuria occurred after the ingestion of small doses of urotropin. In one case two five-grain doeses proved sufficient.

Phleboliths and the Roentgen Rays. H. HARRIS, Sydney. *British Medical Journal*, June 15, 1907.

Harris reports two cases: The first was that of a patient who complained of pain low down in the pelvis on the right side. The appendix was removed, but without any effect upon the pain. An x-ray picture was taken and two shadows each about the size of a shot were found near the termination of the ureter. They were diagnosed as ureteral calculi; at the operation, the ureter was found free, but in the neighborhood of this structure the surgeon could feel these shotlike bodies. The second patient complained of pain in the right testis and region of the ureter for years. X-ray showed a shotlike body about 1 inch to the outer side of the lower end of the ureter. The patient was not operated. The author is convinced that in both instances the shadows were due to phleboliths and quotes Quain to the effect that these lesions are very frequently present in the veins of the bladder and prostate.

Transverse Incision of the Kidney for Lithiasis (*Querer Nierensteinschnitt*). G. MARWEDEL, Aachen. *Zentralblatt für Chirurgie*, July 27, 1907.

Similar to other operators, the author has seen hemorrhage from the kidney following longitudinal splitting of that organ. In five cases for removal of kidney stone he has successfully used a transverse median incision. The hilus is grasped, the location of the vessels noted, and after temporarily clamping the pedicle, a transverse cut is made until one of the calices is reached. The calix is opened and split slightly upward and downward to permit of the introduction of the examining finger. After the stones have been removed the kidney is sutured either with or without drainage, depending on the nature of the case. Spurting vessels may first be grasped and then tied. Marwedel recommends this incision because it injures less parenchyma and is less apt to be followed by hemorrhage. He, however, excludes its application to cases of severe infection where extensive drainage is wanted, or where miliary or larger abscesses are to be expected, for here the longitudinal incision exposes larger surfaces to the influence of drainage.

Lumbar Ureterostomy After Rovsing (*Zur lumbalen Ureterostomie nach Rovsing*). WILMS, Basel. *Zentralblatt für Chirurgie*, July 27, 1907.

Rovsing has recommended lumbar ureterostomy instead of implantation into the rectum. Wilms has used the extraperitoneal incision employed for exposing the ovarian veins in puerperal sepsis and by this route laid bare the ureters. They are cut across about 5 cm. from their bladder insertion and fastened into the abdominal wall just above the anterior superior iliac spine. About 4 cm. of the distal end of the ureter is placed in a tunnel beneath the skin, and when this wound has healed the skin is freed and sutured so as to surround the ureter like a tube, granulation and subsequent contraction being thus avoided. By placing the ureteral openings anteriorly the patient is able to keep himself cleaner and attend to the change of dressings himself. No infection of the kidney follows external ureterostomy.

Report of 300 Operated Tumors of the Bladder (*Bericht über 300 operierte Blasentumoren*). A. VON FRISCH, Vienna. *Wiener Klinische Wochenschrift*, October 3, 1907.

Of the 300 cases only 3 were children; there were 256 men, and 44 women, the great majority being elderly. Ninety-five tumors were carcinoma; 201 so-called benign papillomata, of which 10 per cent. showed beginning carcinomatous degeneration in serial section. Therefore, two-thirds of all the tumors proved malignant. It is impossible to recognize the non-malignant or malignant nature of papillomata by means of the naked eye or by means of fragments obtained in the urine and submitted to examination. Careful microscopic examination is necessary. About half of the papillomata were multiple. The site of predilection of all tumors is on or near the trigonum. All the tumors were removed by typical suprapubic section with broad exposure. In papillomata the excision was merely carried through healthy mucosa, in carcinomata the entire thickness of the bladder wall was removed, as much as half of the bladder being sacrificed in some cases. Where the prostate was involved, this gland was entirely or partly removed. Only in far advanced cases, in which complete excision was out of the question, were curette and cautery employed. In all other cases clean excision with the knife was resorted to. The bladder defect is best sutured with silver- or iodin-catgut, and the bladder is packed and kept emptied by suprapubic syphon drainage. In favorable cases where the urine was clear, v. Frisch has sutured the wound without drainage, but with some increase in the mortality. Of the 300 cases, 42 died (14 per cent.); of these, 24 cases (25.3 per cent.) carcinomatous tumors, 18 (9 per cent.) papillomatous. The average healing time was 3½ weeks.

The chief causes of death were septic processes, renal infection or pneumonia. Later post-operative reports were obtainable in 164 cases. Of the benign papillomata 53 could be followed. There were 21 recurrences within 1 to 8 years, several patients being operated upon 2 to 4 times. Forty-nine papillomata with carcinomatous changes were subsequently watched. Of these 29 had recurrence within ½ to 6 years. In several the recurrence took the form of infiltrating carcinoma. Sixty-two carcinomata could be followed; every one recurred, but a free interval

of as much as 7 years was noted in one. The majority, however, had recurrences in 1 to 3 years. In only two cases would the author consent to a second operation. The characteristics of the recurrences were the comparative painlessness and freedom from hemorrhage. Metastases were noted in seven cases, but in nearly half of all the cases the regional lymphatic glands were not involved. Of the benign papillomata not a single recurrence appeared at the site of the primary tumor.

In every bladder tumor early operation is indicated. Only suprapubic section need be considered, for it alone affords complete access to the site of trouble. At what period the danger of recurrence should be regarded as past is doubtful, for returns have been observed after many years.

Iodin-Benzin-Disinfection (*Ueber Jod-Benzin-Desinfektion*). HEUSNER. *Deutsche Zeitschrift für Chirurgie,* April, 1907.

The author reports on further experience with his new method of disinfection, which has now been employed by him for 1½ years. The fluid consists of 1 gram of iodin in 10 gms. of ether (or simply 10 gms. of tincture of iodin), 750 gms. of benzin, and 250 gms. of paraffin-oil. This mixture is kept in a 3-4 liter bottle reinforced with basket-work. Care must be taken to avoid pouring the dregs into a fire. Each person taking part in the operation is given 250 gms. of solution in which the hands and arms are scrubbed for five minutes with a brush and gauze, without previous scrubbing in water. After this disinfection the hands are rubbed with 2/10 per cent. iodin-vaselin. Linen gloves may be worn, but rubber gloves are injured and made brittle by the benzin. The patient's skin is rubbed with the iodin-benzin mixture at the site of operation, but in regions with delicate skin, such as the genitals, it is advisable to add 250 gms. more of paraffin oil in order to avoid irritation.

No injury to the skin or constitutional iodin effect has been noted. The bacteriological tests have shown excellent results. The method is cheaper than the alcohol-sublimate method. Catgut is prepared by being placed for 14 days in a 2 per cent. iodin-benzin solution, then permanently stored in 2 per cent. iodin-paraffin mixture. Silk may be similarly prepared and kept ready for use.

The Ideal Ligature. A. D. WHITING, Philadelphia. *New York Medical Journal,* September 14, 1907.

Whiting has made a laboratory study of the various methods of preparing and sterilizing catgut, and arrives at the following conclusions:

(1) The ideal ligature is obtainable by treating catgut before it has been twisted into a solid cord or string.

(2) Catgut treated before it is twisted is much stronger than catgut sterilized after it has been made into a solid cord or string.

(3) It is possible to thoroughly impregnate the untwisted gut with a chemical which will become a component part of the catgut when twisted.

(4 Silver iodid gut will remain sterile as long as it is retained in the living tissues and will possess germicidal powers until it has been absorbed or replaced by living cells, the fluids of the body breaking up the silver iodid into silver, iodin, and various compounds of these chemicals.

(5) It is possible and practicable to produce catgut that is absolutely free from germ life and that has antiseptic and germicidal powers, by treating the gut with various chemicals before it is twisted into a solid string or cord.

A Case of Suppuration of the Mesenteric Glands. NEAL MACLEOD, Shanghai. *China Medical Journal,* July, 1907.

A ship captain, aged 51, was seized five days previously with vomiting, chills, fever and constipation. On the day of admission he had four stools, each of these with blood and attended by severe griping pain. He complained of pain in the hypogastrium; there was tenderness in the right iliac fossa and the abdomen was slightly tympanitic. The tenderness was present on the next day, when there were two more stools. After this there was nothing abnormal with the bowel function. The temperature was of the septic type and frequently reached 105, occasionally even as high as 108. There were rigors and sweating. After the first two or three days, the only complaint was an occasional headache. The patient died on the sixty-third day. Autopsy showed suppuration of practically every mesenteric gland. The source of infection was not discovered.

The Causes of Failure in Tendon Grafting. DAVID SILVER, Pittsburg. *Pennsylvania Medical Journal,* August, 1907.

In his rather thorough review of this subject, Silver offers the following causes of failure: (1) The paralysis must not be progressive. (2) The paralysis must have reached its final or permanent stage. (3) The muscular power remaining should be sufficient to justify operation. (4) The existence of deformity is a contraindication to immediate operation. The deformity must be overcorrected a sufficient time, to allow muscular adaptation to take place. The author believes that at least six months should be allowed to elapse after the deformity has been reduced. (5) There has been an inaccurate determination of the extent and degree of the paralysis. (6) Lack of simplicity in the plan of operation. (7) Failure to appreciate the relative value of the muscles. (8) Choice of wrong method for obtaining power. (9) Transplantation of muscle under insufficient tension. (10) Inefficient method of suture. Of the many methods of suture the interweaving method of Lange is the best. Additional security may be obtained by carrying the tendon through a slit in the receiving tendon, or in cases of periosteal implantation by passing it through a canal drilled in the bone. (11) Insufficient strength of union. Hemorrhage and infection should therefore be avoided and the preservation of the sheath is of the greatest importance. (12) Formation of adhesions. (13) Insufficient after-treatment.

Torticollis. The Results of the Treatment of Cases of Acquired and Congenital Muscular Torticollis at the Boston Children's Hospital Since 1879. E. H. BRADFORD and J. W. LEVER, Boston. *Boston Medical and Surgical Journal,* August 22, 1907.

The authors base their observations upon the study of ninety cases. Of these forty-six were of congenital origin; the etiology of the remainder included abscess of the neck, rheumatism, typhoid, measles, scarlet fever, adenitis, hematoma at birth, instrumental labor, influenza and traumatism. There have been various theories advocated as to the cause of congenital torticollis but that favored by the authors is the ischemic theory advocated by Josserand and Vianny. These authors showed that the sternal head of the sterno-mastoid muscle receives normally the smallest supply of blood furnished to any part of the muscle. With the head flexed and rotated in the position it would normally resume "in utero," the arterial supply is much diminished, or wholly cut off, owing to pressure on the middle sterno-mastoid artery by the surrounding parts and the proximity of the thyroid cartilage. The artery is a small branch from the superior thyroid artery and is the sole source of supply to the sternal head of the sterno-mastoid muscle. The authors discuss the causes of asymmetry of the face. In most cases of congenital torticollis there is facial asymmetry at birth. In the majority of instances this asymmetry persists after operation. Two methods of treatment have been in vogue for the treatment of torticollis, the non-operative and the operative. The authors dismiss the former as entirely unsatisfactory. The operative method consists in the open division of the sterno-mastoid muscle. The muscle may be divided at one of three points, the mastoid insertion, the middle and the sterno-clavicular junction. The authors discuss the advantages and disadvantages of each and conclude that the best site is at the sterno-clavicular junction. The incision should be parallel to the clavicle and should be made to extend from the middle of the sternum to at least one-third the length of the clavicle. With a director beneath, the insertions are divided about half an inch above their attachments. It is unnecessary and may even be dangerous to divide the deep cervical fascia which lies directly beneath. In one case in which this was done the internal jugular vein was injured. Great pains must be taken to secure aseptic union in order

to get minimal scar formation. After the operation the head is manipulated into an over-corrected position and a plaster of Paris dressing is applied, leaving a window for the wound. This plaster dressing is worn a month, after which a so-called Buckminster-Brown appliance is worn for three months.

Of the seventy-two operated cases, the after results in sixty-two patients are reported. In fifty-three the head was straight, eight cases were improved, one unimproved, and in two there was recurrence.

The Parathyroid Glandules, Their Blood Supply and Their Preservation in Operation Upon the Thyroid Gland. W. S. HALSTED and H. M. EVANS, Baltimore. *Annals of Surgery*, October, 1907.

By careful injection and dissection experiments in man Evans has found that the parathyroid glands are supplied by definite parathyroid arteries which enter the gland at the hilus. The origin of these arteries is usually from the inferior thyroid but they may arise from an anastomosis between the superior and inferior thyroid arteries. There are few vascular connections between the glandules and their connective tissue envelope.

Halsted says that more radical removal of the thyroid can be practised if the parathyroids are preserved. It is in the attempt to stop hemorrhage that the blood supply of the parathyroids is cut off, as there may not be room to insert even two small artery forceps peripheral to the site at which the branch giving off the parathyroid artery enters the thyroid gland and the small but important bloodvessel to the glandule. To avoid accident Halsted performs the operation according to Mayo's "subcapsular method," or as he calls it "ultra-ligation." Each vessel is caught just as it enters the gland substance. The upper lobe is the starting point and care is used to draw the gland toward the opposite side so as to exert continuous tension, but at first only to deliver the upper pole until all of its vessels are caught, then only is the rest of the gland drawn out. By careful work the lobe may be removed without tearing a single vessel, in 10 minutes. Light ether anesthesia is given by an expert. The post-operative care should be entrusted to specially competent nurses. The patient must be saturated with water—by mouth or rectum or subcutaneously. Lately Halsted has hoped to combat the post-operative toxemia by chilling or freezing the neck region both before and after operation in order to reduce absorption. Sometimes the liberation of a dram of serum from the wound has afforded relief. The question arises whether a very small vertical incision, which offers less absorptive surface than the usual liberal semilunar cut, might not prove of use.

On Tracheotomy in Emergencies, in Laryngeal and Pharyngeal Stenosis. M. IVERSON, Stoughton, Wis. *Wisconsin Medical Journal*, August, 1907.

Iverson has invented a new method of tracheotomy, the advantages of which are rapidity and simplicity. It can be performed easily without assistance and there are no changes of membranes (in diphtheria) clogging the opening. With the head in the hanging position, a two-inch median incision is made, the center of which is the cricoid cartilage. The latter is hooked at its lower border with a hooked retractor; a narrow knife is inserted close above the cartilage and the membranes, cricoid and fascia are divided from within out; the first tracheal ring is also divided but care should be taken not to injure the fascia above it. The wound is opened wide and the largest canula possible inserted.

Septal Perforations; Their Closure by Plastic Operation. CHEVALIER JACKSON, Pittsburg. *Medical Record*, October 12, 1907.

A long tongue flap of mucosa, free edge posteriorly, is made along the inferior turbinated; the flap must be the length of the bone, and at least 6 mm. broader than the perforation. After revising the edges of the perforation, the flap is brought forward and sutured by either the Kilian or Yankauer methods. This, of course, causes a synechia; after healing has taken place, the synechia is removed by clipping out a section of the bridge. It is essential that all excess of the inferior turbinal be removed; if this is not done a troublesome synechia will result. Should a small opening remain after the operation, a similar operation on the opposite side will probably be successful.

The Surgical Treatment of Excessively Thick Lips. C. C. MILLER, Chicago. *Virginia Medical Semi-Monthly*, September 13, 1907.

The author uses local anesthesia. For protrusion of the upper lip he makes a median vertical incision in the mucosa just beneath the philtrum. This incision is then sutured transversely. For protrusion of the lower lip he makes two vertical incisions on either side of the median line and then sutures in the transverse direction.

Intratympanic Operations Under Local Anesthesia. M. J. BALLIN, New York. *Medical Journal*, October 5, 1907.

The author reports particularly the value and technic of paracentesis under local anesthesia. The method employed is as follows: After placing a piece of cotton into the canal a cleft speculum is introduced and the superior wall of the canal is anesthetized with ethyl chlorid. This is done merely to prepare for the injection of the cocain solution. Fifteen minims of the latter (1 per cent. cocain to which 5 to 6 minims of adrenalin solution, 1-1000, have been added) is injected with a long hypodermatic needle along the superior wall of the canal. The cotton is removed and in 4 to 5 minutes the drum will be found to be anesthetic. The method is not applicable to children or to nervous adults. The author has found this method to be eminently satisfactory.

Villous Papillomata of the Rectum. B. M. RICKETTS, Cincinnati. *New York Medical Journal*, August 31, 1907.

The author reviews the literature and reports one case. These papillomata occur always in adults; the youngest patient reported was seventeen years of age. They are usually soft, smooth, bleed easily and may be sessile or pedunculated. They usually occur about three inches from the anus and upon the posterior wall. The size varies from a millet seed to five inches or more in diameter. The symptomatology is somewhat as follows: There is always a profuse and frequent discharge of a yellow, turbid, albuminous secretion, both voluntary and involuntary, immediately followed by relief from an intense desire to evacuate the bowel. Constipation is a constant symptom and causes distress when the feces pass out of the rectum. Prolapse is frequent, hemorrhage and tenesmus are constant symptoms. There is usually emaciation and sometimes cachexia. Frequent evacuation is common and painful; the pain is especially present when the broad base is attached to the prostate gland or urethra. The author describes minutely three methods of operation, the intra-anal, the extra-anal and the abdominal resection. It is only rarely that the latter two methods are applicable, owing to the situation, small size and the frequency of pedunculation.

The Operative Treatment of Carcinoma of the Cervix. C. LOCKYER, London. *British Medical Journal*, August 24, 1907.

Lockyer compares his results obtained in previous years by vaginal hysterectomy and those obtained by the Wertheim operation performed by him since 1905. In vaginal hysterectomy he had no primary mortality in thirteen cases, while there were seven cases of recurrence. In twelve patients in whom the Wertheim operation was done, there were four primary deaths, but only two recurrences in the remaining cases. On the other hand the field of applicability for the Wereheim operation is far greater than that for vaginal hysterectomy. Of seventeen cases of cancer observed twelve were operable by the Wertheim method but only two by the vaginal. He believes that the primary mortality from the Wertheim operation can be further reduced by greater attention to preliminary cleansing. He also believes that undrained cases do better than the drained. Altogether the author has become convinced that the vaginal operation has little or no rôle in the treatment of cancer of the cervix.